THE IRON AGE

New York, July 4, 1929

ESTABLISHED 1855 VOL. 124, No. 1

Mass Production Methods Used in Airplane Plant

BY BURNHAM FINNEY*

EMPLOYING mass production methods similar to those long used in the automobile industry, the Waco Aircraft Co., Troy, Ohio, has recently put into operation a new plant which is now turning out more than six fuselages a day and which has the capacity for manufacturing ten or more a day.

Since the founding of the company in 1921, it has specialized in building three-place open cockpit commercial types of airplanes. The basic model has always been so designed as to allow for additional improvements and refinements without attempting to create yearly models. This method has permitted rapid adoption of new ideas and quantity production of service parts.

Models now being built are the "90," with 90-hp. "OX-5" motor; the "150," with Hisso 150-hp. motor; the "180," with Hisso 180-hp. motor; the "165" Straight-Wing, with 165-hp. Wright Whirlwind motor (five-cylinder); the "220" Straight-Wing, with 220-hp. Wright Whirlwind motor (nine-cylinder); the "220" Taper-Wing, with 220-hp. Wright Whirlwind motor (nine-cylinder); and the "300" Taper-Wing, with 300-hp. Wright Whirlwind motor (nine-cylinder). The Taper-Wing sport models are powered with either the 220-hp. or 300-hp. Wright Whirlwind motor (nine-cylinder).

Comprising eight buildings, the new plant has approximately 100,000 sq. ft. of floor space, of which 80,000 sq. ft. is in the main manufacturing building. Other structures consist of the office and administration building, heat and power plant, acetylene generator building, paint and oil storage building, repair hangar, sales department hangar and cafeteria. Adjoining the plant is the company's airport, which is of sufficient size to accommodate or test the largest planes. It has two runways, each of which is 3000 ft. long. One runway is 1300 ft. wide and the other 400 ft.

The main manufacturing building is of monitor-type construction and is exceptionally free from supporting columns, thereby affording excellent natural light and ventilation. The walls and flooring are concrete, and the columns, trusses and sashes, steel. Rough actinic glass is used throughout to minimize heat and sun glare. Fire protection is afforded by an automatic sprinkler system, with an additional automatic deluge system in paint spray booths. A 75,000-gal. tank tower provides a source of water auxiliary to the city water system.

Stockroom Centrally Located

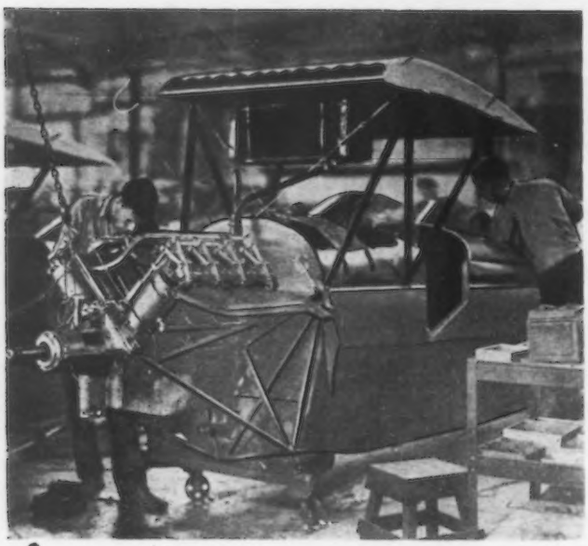
In the center of the building is a large rectangular stockroom, from which parts and raw materials go out to the sub-assembly and final assembly departments. Occupying one complete section of the building are woodworking, wing-rib assembly and wing assembly departments. Running the length of one side of the plant are the machine shop, sheet metal shop, fuselage and tail surface assembly jigs, welding jigs, motor and propeller sections, and sand-blast room.

All metal parts, such as cockpit cowlings, motor cowlings, instrument boards and spinners, are cut out and fitted to master molds in the metal department to insure uniformity of fit and to provide for interchangeability of parts for each airplane of a specified model. Rough edges are curled over a metal wire shaper, which acts as a stiffener for the beading. Thus, no sharp or serrated edges are allowed to come in contact with the pilot or passengers of a plane.

The cockpit cowling is drilled at close intervals around the upper edge, and through these holes are fastened the thickly padded, upholstered leather beading. Streamline metal covers for the oleo strut are cut out and constructed in the metal department.

Wherever a bolt attaches entirely through a wooden member, a steel plate is used to cover both ends of the bolt hole, thereby increasing its strength. Brace wires, for instance, are connected with jutted wings, which are an integral part of such a steel plate. This method has been

*THE IRON AGE, New York.



Fuselage Finished to Cockpit Covering, Motor Fairings and Gas Tank

substituted for washers wherever they have shown a tendency to grind themselves into the wood. All internal fittings, such as brace wires, bolts, screws, nuts, plates and control members, are cadmium-plated to prevent rust. Incidentally, all metal parts and fittings are tested and inspected according to military standards.

Close Attention to Detail in Rib Construction

In the construction of taper wings, tubular steel members of an ingenious design are added for interior bracing. They account, in part, for the sheer maneuverability of this type of wing. By the use of jigs of special design, wing ribs are rapidly fabricated by operators who specialize on this one operation. Stock for this purpose is prepared in the woodworking department and is conveyed to the jig, where it is placed in a group of small compartments close to the operator. With glue and a sufficient quantity of brads at his side, the operator quickly assembles the wing ribs. Jigs are constructed of steel blanks mounted on a solid steel plate, this structure being bolted to a rigid wood and steel unit waist high to the operator. This rigid set-up makes possible a uniformity of construction in each wing-rib.

The rib is built in the manner of a truss design with two long members of spruce, to which are attached five shorter members of spruce at proper cross-sections. At each intersection of the main and cross members, plywood plates are attached with brads. Following the custom of bridge engineering, these plywood plates are triangular in shape and attach equally to three points of the rib. Each brad is so placed as to strengthen and bind a member without causing splits or fractures.

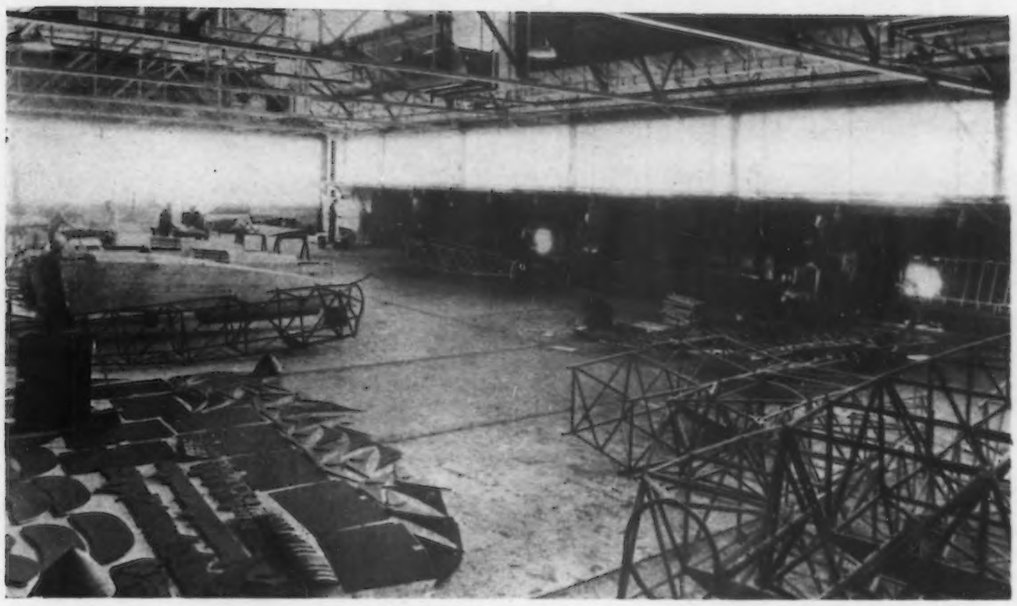
Over 200 brads are used in connecting plywood plates in the wing-rib assembly. The brads are of special design and weight and are cement-coated and diamond-tipped. In addition to the cement coating, several ferruled serrations are added to the shank. Together they act as preventives to loosening or pulling out. Twenty triangular plates of plywood are employed in the wing rib. Each member is glued in place before the brads are inserted. When dried, wing ribs are thoroughly buffed to remove sharp corners and rough edges. Ailerons are constructed in separate jigs with a similar accuracy in detail.

Finished ribs and ailerons are carried to the main wing assembly department, where ribs are attached to the wing spars. The latter are of first-grade, clear-grained spruce. Specifications call for first-cut stock, not routed stock, and no latitudes are allowed.

Six long ribs are first attached to the spars and then six shorter ribs, with which are connected the ailerons. As each rib is set in place, it is nailed to the wing spar. To prevent its sliding or shifting, it is wedged in place by plywood buttresses at each side, the top and the bottom. These buttresses also are nailed in place. The wing-walk is next added, and then tie rods and ailerons. The curved bow is attached to the wing end, the leading and trailing edges are set in place, and finally the dural intermediate nose ribs are added. The trailing edge is of double-coppered steel plate.

Fitted with wiring attachments and tubular aileron controls, wings pass final inspection and are conveyed to

At Final Assembly Line Wings Are Rigged and Final Check Is Made of All Parts and Controls



Paint Department, Showing Wing Being Sprayed in Spray Booth in Background

the paint room to be sprayed with varnish as a preservative from moisture. The wing fabric is attached when the varnish is dry. The fabric is rib-sewed to a strip of reinforcing tape running completely around the rib contour.

Wings then return to the paint room to receive a number of coats of "dope" until sufficient tautness is obtained, when spray guns give them several finish coats of lacquer. From this point wings pass to the final assembly line for rigging and lining up to the fuselage. Tail surfaces, center section and fuselage fabric covers are treated in the same manner as wings.

Tubing Stockroom Adjoins Machine Shop

In the metal shop are constructed the oleo struts used in the landing gear, propeller guards and spinners, pilot's and passengers' seats, fuselage, deck covers, cockpit cowlings, engine cowlings, instrument boards, wing and motor inspection plates, gas tanks, radiator shutters, crankcase covers, exhaust stacks, fire-walls, fairings and other special metal parts. All small parts, such as wing and aileron hinges and braces, are manufactured in the company's machine shop. Here the metal tubing for fuselage and tail-surface control assemblies is specially milled on a radius to give it a curve-out instead of a sheer cut. This permits each tube to fit snugly against the next member so that the welding operation covers the surface of both members without having any crevices to fill. Certain tube sections are spline-cut in addition to having the milling operation. They are used wherever more than two members are to be joined and welded. For the convenience of the machine operators, a storeroom for rough tubing is maintained close to the machine shop. After being machined, tubular members are placed in compartments near the operators of the fuselage and tail surface assembly jigs.

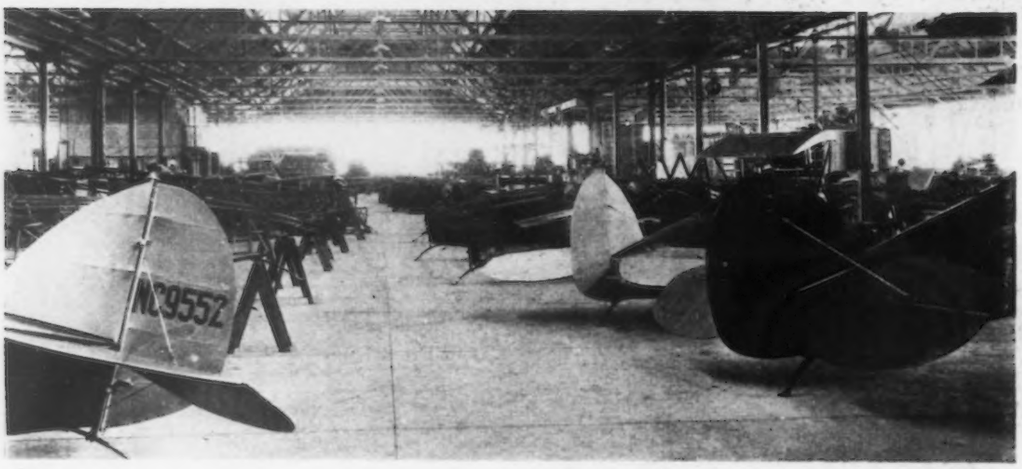
Side-wall members of the fuselage are fabricated and welded in three operations. The first operation is for the cockpit sections, the second for the motor and gas tank, and the third for the tail surface. Because each of these sections performs different functions in flight and has separate weight-carrying abilities and stresses, they are constructed of tubing of different gages. After the side-walls have been fabricated and welded, they are placed in a box jig, where the cross members are fitted and welded. Tail surface members are fabricated and welded in separate jigs designed for that purpose. Three separately-constructed box-like structures are then joined and welded in a larger jig, and the fuselage is complete. Gas for welding is piped to each jig from a central source and is available for the operator at the turn of a valve.

Assembly Line for Fuselage

The motor mounting is drilled and the holes are fitted with metal bosses. The fuselage and tail surfaces are conveyed to the sand-blast room, where they receive treatment similar to the etching of propellers. Immediately after this operation they are inspected and tested and are taken to the paint department to be sprayed with paint. From the paint department the fuselage goes to the assembly line and the tail surfaces to the covering section to receive their fabric cover.

In the assembly line the fuselage receives the floorboard seats, gas and oil tanks, stick, rudder, tubular control members, tail skid, instrument boards, safety belts, upholstering and doors. The gas tank is hung on steel wire cables and is bound in the same manner. To prevent chafing and slipping the cables are attached over heavy felt padding. The control tubing extends from the fuselage to the tail and to prevent binding in operation is

Three Separately Constructed Box-Like Structures Being Joined and Welded in Large Jig, Completing Fuselage



Assembly Line, Looking Down Main Aisle

carried through fiber tubes larger in diameter than the control tubes. The fiber tubes are greased and are so situated as to be inspected, replaced or greased quickly.

Specially designed blocks of wood are taped to the fuselage at intervals. They serve for the use of screws or bolts in attaching the members described above, and also to preserve the metal tubing from weakening through the introduction of screw or bolt holes.

After the fire-walls, fairings and special attachments have been added, the fuselage is ready for the skeleton frame to which is fitted the fabric cover. This cover receives the same treatment of "doping" and painting as the wing fabrics. The painted fuselage is then returned to the motor department, where the motor is added. Here also are attached the laced cockpit padding, windshields, instruments, motor cowlings, tail surfaces, center wing section, spinner and prop, oleo struts, landing gear (certain models are equipped with brakes), and fuselage striping.

In view of the fact that motors of various kinds are used, several arrangements have been made for mounting them. In the case of the OX-5 motor, the mounting is on braced tubular arms welded to the main fuselage section, the arms being drilled at regular intervals and fitted with steel bosses. Wright Whirlwind motors are similarly mounted on circular braced steel tubing.

Planes Subjected to Rigid Tests

At the final assembly line the wings are rigged and lined up and a final check of all parts and controls is made. The plane then is rolled to the field about 50 yd. distant for a test flight. Each plane is flight-tested before delivery. The performance of the engine is first tested on the ground, and notations are made accordingly. All instruments are checked to see that they are functioning properly. The plane is checked for take-off, landing and stability in the air and is put through a series of maneuvers to check the performance. After landing, it is inspected for oil or fuel leaks. The test pilot certifies to its air-worthiness.

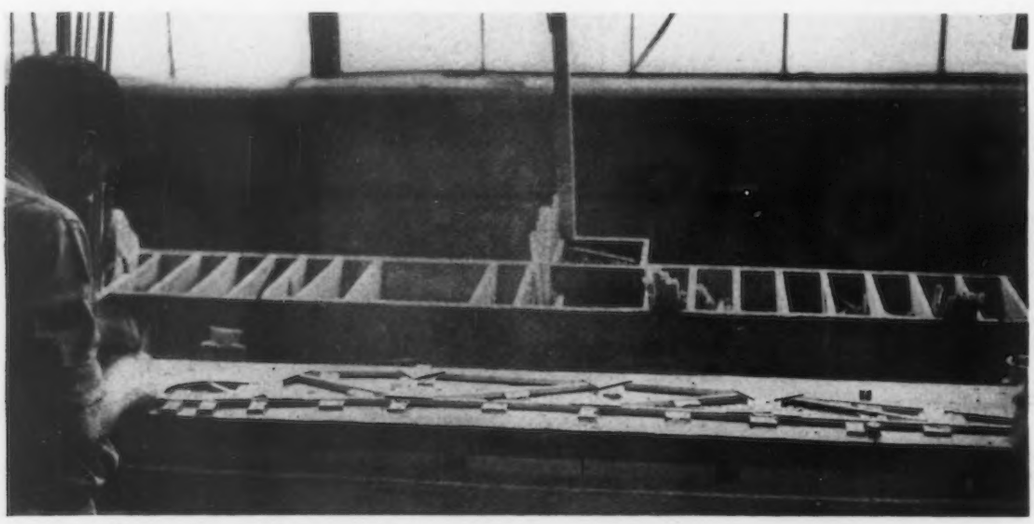
The fuselage and tail surfaces, as well as the landing gear "Vs," are made of S.A.E. No. 1025 mild carbon steel tubing, which is readily welded and which gives a better strength-weight ratio than S.A.E. No. 1020 low-carbon steel. It is less expensive than S.A.E. No. 4130 chrome molybdenum steel and can be purchased in large shipments without delay. Chrome molybdenum steel, however, is used for the axles of the planes, because they are subjected to high bending stresses.

Instrument panels, wheel disks, cowling, baggage compartment doors, inspection doors, seats, spinners and head streamline are constructed of aluminum, which also is employed in many other places where lightness of weight is a major consideration. The degree of hardness of the aluminum used in various parts is determined by the bends and the stiffness required.

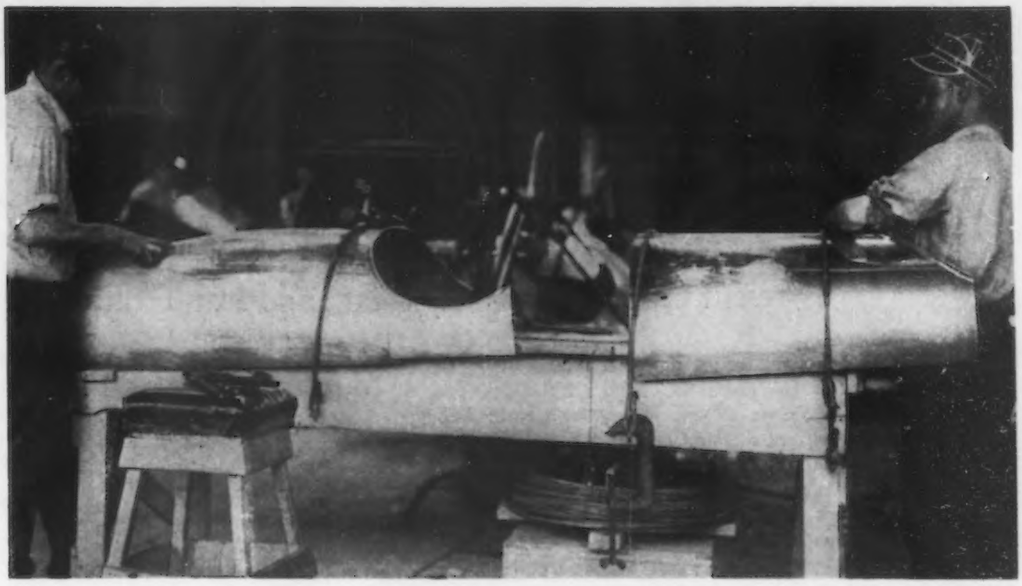
Wings Edged with Duralumin

For the leading edge of the wings to support the fabric between the ribs in the tapered wing model, duralumin is used. This material has been given the preference over aluminum in certain places where considerable stiffness and strength are necessary.

Fire-walls and fuel tanks are made of terne plate,



Cockpit Cowling Being Cut Out and Fitted to Master Mold



Sidewalls of Fuselage, Placed in Box-Like Jig, with Cross Members Being Welded

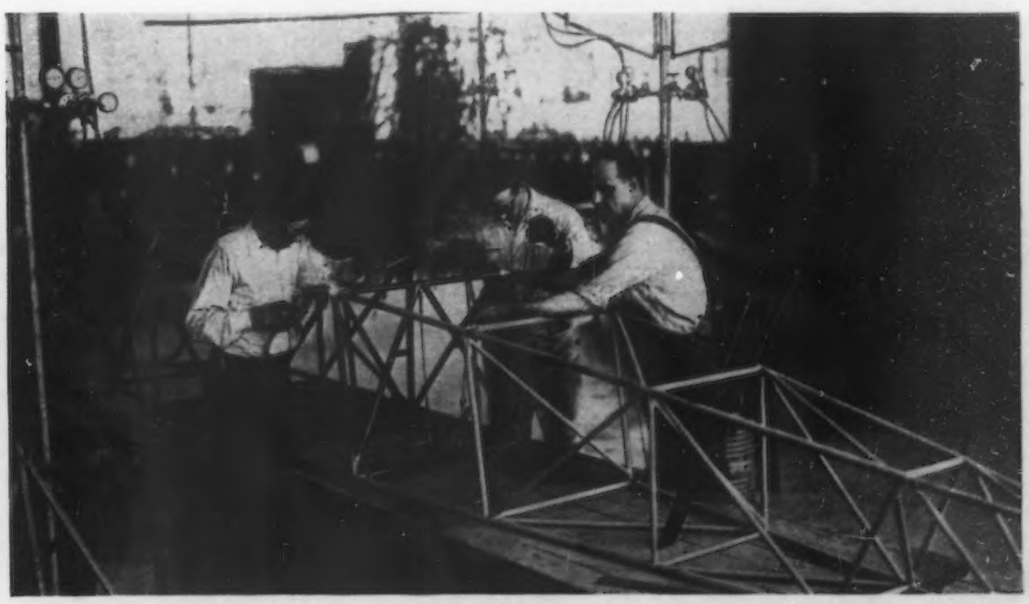
which may readily be soldered. This is especially advantageous in the case of fuel and oil tanks. The low melting point of aluminum precludes its use for fire-walls. Fittings are made almost entirely of S.A.E. No. 1025 mild carbon steel. Wherever high physical properties are required chrome molybdenum steel is used.

Plant Served by Spur Railroad Track

The plant is served by a spur track of the Big Four railroad. This track, suppressed to the floor level, extends through 200 ft. of heated shipping and receiving sections of the main manufacturing building, affording protection to materials in inclement weather. Electric hoists have been installed at one end of the platform to facilitate the transfer of material to railroad cars or to motor trucks, which also are loaded at this point.

From its inception in 1921 the Waco Aircraft Co., until recently known as the Advance Aircraft Co., has built an airplane in which the attainment of high aerodynamical ability at an economical cost for commercial purposes has been stressed. The founder of the company, Clayton J. Bruckner, is president and chief engineer. Heading the administrative division, as vice-president and general manager, is Lee N. Brutus.

By Use of Jigs of Special Design, Wing Ribs Are Rapidly Fabricated by Operators Specializing on This Operation



Gas Welding Operation in Building Fuselage. In foreground is cut-out of tubing enlarged to show radial cut

Cast Iron as Engineering Material

Testing Society Stages Symposium to Demonstrate Many Advantageous Qualities—How Test Bars May Represent Casting—Impact, Wear and Heat Treatment

WITH the object of calling the attention of engineers to the many excellent physical properties of cast iron, a symposium was arranged for the thirty-second annual meeting of the American Society for Testing Materials at Atlantic City, last week, June 24 to 28. The symposium was comprehensive and was made up of brief papers dealing with various phases of this broad field. It was organized by committee A-3 on cast iron. A large attendance revealed the keen interest in the subject.

An introduction to the symposium was presented by H. Bornstein, director of laboratories, Deere & Co., Moline, Ill., and chairman of the committee. There has not been the same progress in the classification of cast irons as there has been in steels and also in the determination of their physical properties, said Mr. Bornstein. Accurate information as to cast iron has not been widely disseminated to the engineering profession. Therefore some suspicion has arisen as to the value of such iron as an engineering material. Considerable progress has been made in cast iron metallurgy and irons of high physical properties are now available. Specifications have not kept abreast of practice. Cast iron is a reliable engineering material and knowledge as to its properties is necessary to encourage its proper use in industry.

The purpose of committee A-3, said Mr. Bornstein, has been to assemble a group of papers outlining the classification of physical properties of cast irons, according to a plan formulated a year ago. The presentation is realized as far from complete. Only a beginning has been made.

How Gray Irons Should Be Classified

IT is necessary to classify gray irons before an intelligent general study can be undertaken, said J. W. Bolton, chief chemist and metallurgist, Lunkenheimer Co., Cincinnati, who introduced the symposium and took as his subject "Classification of Gray Iron Alloys." The most logical classification seems a primary one according to causative factors. These are:

1. Chemical composition—initial, incidental and final.
2. Structural and mechanical makeup of charge.
3. Melting process.
4. Thermal and mechanical history—furnace spout to cooled casting.
5. Design and workmanship.

Mr. Bolton advocates a primary classification based on chemical analysis and a secondary one upon cooling rate. He shows how a mathematical formula can be applied to determine relative cooling rates of simple shapes. His chemical classification is divided into four groups of eight subdivisions each, based on the carbon and silicon contents respectively.

Section and Composition Affect Properties

THE question of the effect of section and various compositions on the physical properties of cast iron was discussed by R. S. MacPherran, chief chemist, Allis-Chalmers Mfg. Co., West Allis, Wis. The author's tests were conducted with a threefold object: To determine the effect of increased section on the tensile strength of cast iron; second, to determine the effect on hardness of the removal of various amounts of stock; and third, to determine if the high-test iron followed the same laws as the weaker grades. His conclusions were as follows:

> The effect of increasing the section of certain types is to materially and progressively lower the tensile strength.
>
> Removal of extra stock in these types is progressively accompanied by loss of hardness.
>
> Under cooling conditions similar to those described in the paper, the high-test iron reported on has practically equal Brinell hardness throughout the section.
>
> The grain of the high-test iron is somewhat more open as the center of the casting is approached.
>
> The tensile strength of the high-test iron tends to fall off as the section is increased or as the cooling is retarded, though not to the extent shown by the other two types.

Correlating the Test Bar with the Casting

THAT the test bar does not represent the casting is generally acknowledged in the case of gray iron. An attempt to correlate cast iron test bars and castings was made in a paper by W. H. Rother and V. M. Mazurie, metallurgist and assistant metallurgist respectively, Buffalo Foundry & Machine Co., Buffalo.

The authors report briefly on the work undertaken by various investigators and state that few really tangible facts have been established. Investigators agree that more than one size of test bar is necessary where any account is to be taken of the variation of strength with thickness. Cast iron, as produced in the modern foundry, is really a series of alloys and any attempt at a correlation of test bar with casting is futile unless this fact is recognized.

Through a proper interpretation of the cooling rate of iron it is felt by the authors that the physical properties of a test bar can be correlated with the properties of the casting. This does not imply that a single size will be applicable in every case. It is believed that specifications in the future will cover test bars of every size and that, with an intelligent choice of test bar, the properties of the casting will be predicted accurately from the properties of the test bar.

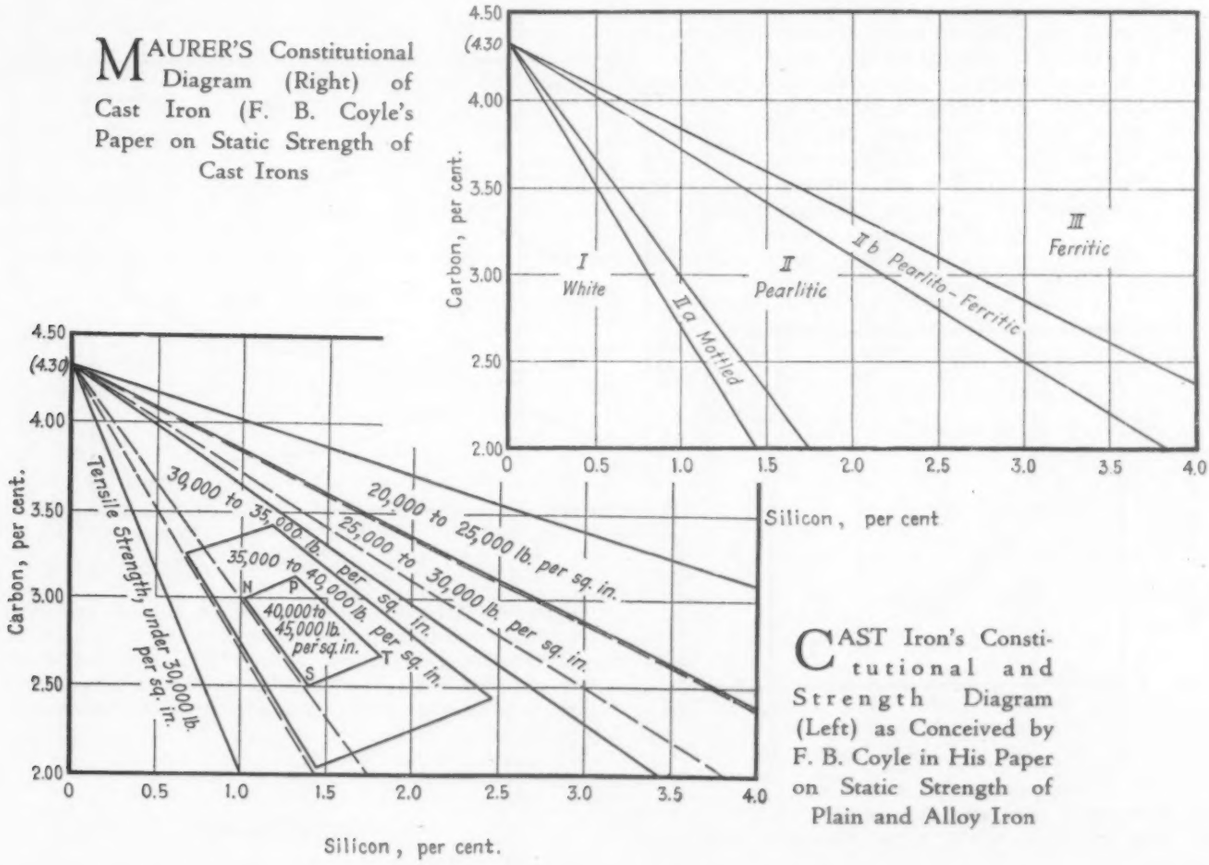
Strength of Plain and Alloy Iron

ANOTHER contribution to the symposium was entitled, "Static Strength of Plain and Alloy Cast Iron," by F. B. Coyle, research metallurgist, International Nickel Co., New York. In the opinion of Mr. Coyle the only tests for strength of cast iron which are really absolute are those for tension and compression. His contribution presents data covering the tensile strength only of cast iron. He starts with the Maurer diagram which shows the relation between structure and composition and presents a series of diagrams, some of which are reproduced herewith, showing an extension of the range of composition, which will produce a pearlitic structure and maximum strength. The elements, nickel and chromium, are used as examples of alloy iron. These diagrams should not be considered, says the author, a sole criterion

on the production of castings. Other practical modifying characteristics, such as hardness and tendency to chill, should be taken into account as well as strength, in the production of suitable castings.

Cast Iron Has Elastic and Fatigue Properties

ELASTIC properties of cast iron were interestingly discussed by J. T. McKenzie, chief chemist, American Cast Iron Pipe Co., Birmingham. Elasticity is that property of a body which enables it to return to its former shape after undergoing strain, and the modulus of elasticity, in tension or compression is the quotient of stress divided by linear strength.



MAURER'S Constitutional Diagram (Right) of Cast Iron (F. B. Coyle's Paper on Static Strength of Cast Irons

CAST Iron's Constitutional and Strength Diagram (Left) as Conceived by F. B. Coyle in His Paper on Static Strength of Plain and Alloy Iron

When applied under clearly defined conditions, the modulus of elasticity is one of the most useful indications of the quality of cast iron. It is very closely related to the analysis when cooling conditions are uniform and therefore is a good index of the casting properties of the iron. The results of some of the author's work on this problem are presented by tables and charts in the paper, one of which is here reproduced.

Another of the engineering characteristics of cast iron included in the symposium was the fatigue properties. This problem was discussed by J. B. Kommers, professor of mechanics, University of Wisconsin, Madison, Wis. His contribution, "Fatigue Properties of Cast Iron," reports the results obtained in casting four lots of cast iron at the University of Illinois and 10 different cast irons at the University of Wisconsin.

In the first case, the fatigue strength of cast iron was found to be markedly increased by oft-repeated strength below the endurance limit. Grooves in cast iron test specimens reduced the endurance limit only a small amount. At elevated temperatures there was found to be no great reduction in the fatigue, tension, and Brinell hardness tests up to a temperature of about 800 deg. Fahr. In the other tests, the materials used ranged from low-strength to high-strength cast irons and the ratio of endurance limit to tensile strength showed an average value of 0.49 and the ratio of endurance limit to modulus of rupture showed an average value of 0.26.

Testing Cast Iron for Impact and Wear Resistance

ENGINEERS in general are interested in the impact resistance value of cast iron, particularly in the case of water pipe. A contribution to this phase of the symposium was made by H. Bornstein in a brief paper entitled "Impact Testing of Cast Iron."

There is no standard test or method for measuring the resistance to impact of cast iron, said Mr. Bornstein, although several methods have been proposed. There is need for a standard method of test. The results of most of the proposed methods are not in general agreement. It is the consensus of opinion, however, that irons high in static strength are also high in impact value. In many cases the shock or impact test is of greater value in predicting results in service than are static tests, particularly where the casting is to be subjected to shock.

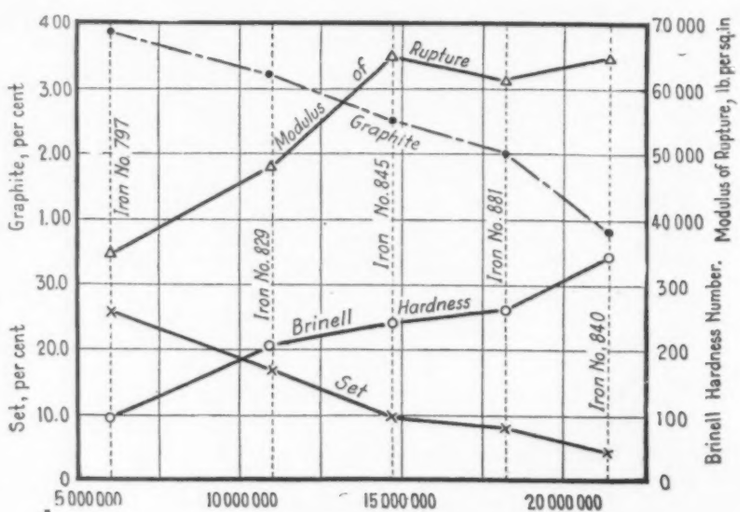
Another property of cast iron for which there is no general agreement among investigators as to the best method of testing is wear resistance. They not only do not agree as to test methods but there are also differences of opinion regarding the influence of various elements in cast iron upon resistance to wear. "Wear Testing of Cast Iron" was discussed by A. L. Boegehold, metallurgist, General Motors Research Laboratories, Detroit. As to wear testing in the case of cast iron automobile engine cylinder blocks, the author describes a method of test which he uses. He discusses the difficulties encountered in trying to conduct a test for wear when a lubricant is present. That the kind of cylinder iron used has no influence upon the result because of good lubrication be-

tween the piston and the cylinder is demonstrated by a brief description of a wear test conducted on an automobile engine constructed of individual cylinders of four different kinds of cast iron after running 20,000 miles.

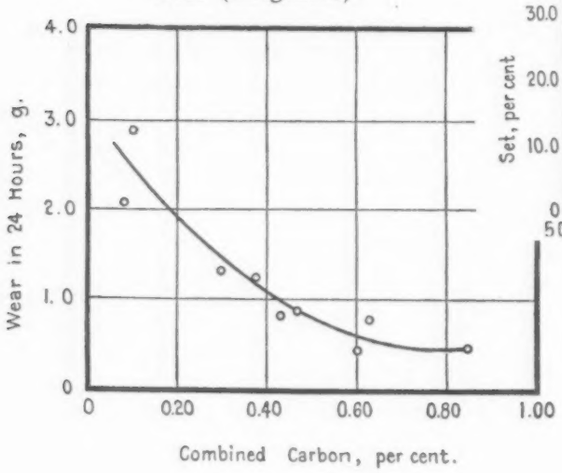
Mr. Boegehold declares that a universal wear test is undesirable but that laboratory wear tests in which service conditions are imitated give valuable data. When lubricants are present, a wear test is difficult. The largest factors in cylinder wear are stated to be grit and lack of lubrication. It is recommended that investigators of cast iron wear should have a comprehensive knowledge of cast iron.

The greatest resistance to wear is to be found in cast irons containing about 0.75 per cent combined carbon in sand-cast gray iron, according to the results of a series of tests and as shown by one of the charts here reproduced.

VALUES for Plastic Deformation (Set) in Six Repeated Loadings to Three-Fourths Ultimate Strength Plotted (Right) Against Ultimate Modulus of Elasticity with Trend of Strength, Hardness and Graphite Indicated (MacKenzie)



Influence of Combined Carbon on Wear (Boegehold)



Corrosion and Heat Treatment

IN the majority of cases studied, cast iron is slightly superior to steel or wrought iron in corrosion-resistance in the atmosphere, says H. O. Forrest in a contribution to the symposium entitled "Corrosion of Cast Iron." The author is director of the research laboratory of applied chemistry, Massachusetts Institute of Technology, Cambridge, Mass. Corrosion tests in soils point to the fact that in general the nature of the soil rather than the types of metal of certain classes is the factor governing the rate of corrosion. There are many cases in which cast iron is superior to other ferrous metals as in the handling of various chemical materials.

In general, factors affecting the corrosion of cast iron include not only the characteristics of the metal itself, but also, to a greater extent, the composition of the corroding medium and the type of protective coating employed. There is a need for the use of a proper protective coating before pipe is put into service or else for treatment of the corroding medium with chemicals to bring about the precipitation of protective scales or films.

Heat treatment of cast iron is comparatively a new subject. One of the commendable undertakings of committee A-3 is an extensive digest of the literature of the heat treatement of cast iron now being prepared.

F. B. Coyle discussed this subject briefly, dwelling upon some of the important features involved. If alloying elements can produce considerable increase in the relative values of properties of steel, it is inferred that alloying elements should produce a like improvement in cast iron. This seems true because cast iron is essentially a steel whose continuity is broken up by free graphite. The intrinsic value of alloy steel is only brought out by heat treatment and it is reasonable to assume that cast iron in general should also be benefited by heat-treating processes.

Mr. Coyle states that there are four important factors to be considered in subjecting cast iron to heat: Artificial aging, alteration of chemical and physical properties, growth, and rustproofing. These factors are considered by the author at three different ranges of temperature for heat treatment. The author believes that systematic investigation in this field of study will disclose that the applicability of heat treatment to cast iron will be of distinct economic value to industry in general.

Views in General

SOME disappointment was evident from the fact that the symposium did not bring out a broad range of discussion. The length of the program militated to some extent against this. Mr. Bornstein emphasized the need of knowledge as to machinability and wear of gray iron and the desirability of some measure of these properties. Dr. Richard Moldenke said that all those interested in cast iron want wear and machinability in the product but one great difficulty is the fact that so "many kinds of castings are poured from one mixture. American practice is far behind Europe in this respect."

Alloys Are Not Cure-Alls

Mr. Coyle called attention to the fact that addition of alloys to cast iron do increase the resistance to wear and that his files show many special results of this kind. It is, of course, often necessary to use different mixtures, but alloying elements are not cure-alls but are a great aid for certain purposes. N. L. Mochel offered two valuable illustrated discussions, one on the question of the correlation of test bars and castings, showing some results which he had obtained. He also expressed regret that the symposium did not include the welding properties of cast iron on which he had done some work. Some of his results were interestingly presented.

Testing Society's Largest Meeting

Membership at Record High—New Standing Committees Bring Total to 48—Marburg Lecture a Feature —Research Inaugurated

ADDING still more prestige to an already enviable record, the American Society for Testing Materials held the largest convention in its history last week. It was the thirty-second annual gathering, held in the traditional place, Atlantic City, June 24 to 28. This location has become so fixed a policy that attempts to break away from it have not been very successful. French Lick, Ind., was the place two years ago. Plans were seriously debated last week of holding one convention every three years elsewhere, probably in the Middle West. Chicago is being considered for 1930. As in the recent past the Chalfonte-Haddon Hall was its headquarters.

Unusual activity marked the work of the very many committees. The zeal and earnestness of these committees is always keen and can be matched by no other society in the world. Starting in early Monday, June 24, there were sessions of committees morning, afternoon and evening and much was accomplished. Each year also witnesses new committees formed and new fields entered for fact-finding or specification purposes.

New high records in attendances were made. The total registration by Wednesady evening of 850 men and 245 women had surpassed all figures for the third day. Final registration totals gave 934 men. This compared with 895 men last year. The previous high record was 905 in 1926.

Marked Progress Reported by Executive Committee

A REVIEW of the progress and aims of the society is contained in the annual report of the executive committee which was presented by Secretary-Treasurer C. L. Warwick at the annual meeting. Some of its important features are as follows:

New Standing Committees Organized

Three new standing committees have been organized within the year: Committee A-10 on iron-chromium, iron-chromium-nickel and related alloys; committee B-5 on copper and copper alloys, cast and wrought, and committee B-7 on light metals and alloys, cast and wrought.

Committee A-10 has had assigned to it a most important group of alloys, in which there is much need of coordinated research on the corrosion resistance and other properties of these alloys. In the organization of this committee it has been necessary to consider the relationship of its field of work to that of committee B-4, originally entitled "metalic materials for electrical heating," which deals with a portion of the alloys in the iron-chromium-nickel system, used especially for electrical heating purposes. Some conflict has developed between the two committees as to their relative jurisdiction. At a meeting of committee A-10 last week a settlement of this controversy was put up to the executive committee of the society. The temporary organization of committee A-10 was voted to continue until the regular time for election of officers. Jerome Strauss continues as temporary chairman, with N. L. Mochel as temporary secretary.

The organization of the new committees B-5 and B-7 is part of a reorganization of committee activities in the non-ferrous metals group, which has come about through recommendation made by committee B-2 on non-ferrous metals and alloys.

After a careful study of the standardization activities of the society, particularly from the administrative viewpoint, and in consultation with the standardizing committees through committee E-5, the executive committee has authorized the organization of a new committee to be known as committee E-10 on standards. It is believed that the new committee will develop into a most important administrative one, particularly with respect to the problem of extending the society's standardization work over the entire field of engineering materials and the relationship of standardization activities with those of other bodies.

Corrosion Work to be Coordinated

A coordinating committee on corrosion has been formed to correlate the corrosion studies of the four committees of the society that are dealing with this important subject as applied to different groups of materials, namely, committee A-5 on corrosion of iron and steel; A-10 iron-chromium, iron-chromium-nickel and related alloys; B-3 on corrosion of non-ferrous metals and alloys, and B-4 on high temperature electric resistance alloys. Each committee has appointed two representatives on the coordinating committee.

With these new organizations the number of standing committees is brought to 48.

Executive Committee Enlarged

Preliminary modifications of the by-laws involve an increase in the number of members of the executive committee from 8 to 10, which, with the four officers and the last three past presidents, will make a total membership of 17. The other modifications provide a method for acceptance and publication of proposed new standards as tentative standards in the interim between annual meetings of the society, a saving of time being thus effected.

Total Membership at New High—4244

Membership of the society made a net gain for the year ended June 1, 1929, of 52. The number of new members for the year was 365, which is slightly better than for 1928 although not so large as that of two or three years ago. Total membership as of June 1, this year, is 4244 as against 4192 a year ago.

Activities on the Pacific Coast

During the past year the executive committee decided to investigate plans that had been under consideration for some time for the establishing of a closer relationship between the society's general activities and the members on the Pacific Coast. As a first step in this direction Secretary-Treasurer C. L. Warwick visited the members in the three Coast States of California, Oregon and Washington last fall. A comprehensive report has been submitted to the executive committee. Among several recommendations is one to the effect that a study be made of the feasibility of devising some means by which Pacific Coast members may function as a group, and means by which groups of members representing producers and consumers may be formed into divisions, affiliated with and functioning as a part of the standing committee.

It was also recommended that the executive committee give consideration to the possibility of arranging for occasional meetings of the Pacific Coast members under official auspices, and that local committees of society members in the Los Angeles, San Francisco, Portland and Seattle districts be appointed for the purpose of promoting the usefulness and extending the influence of the society in those districts. The various recom-

mendations are being carefully considered by the executive committee.

The New International Association

Preliminary arrangements for the participating of the society in the next congress of the International Association to be held at Zurich, Switzerland, in 1931, are now being made by the society's representative on the permanent committee of the New International Association for Testing materials, past-president W. H. Fulweiler. On June 1, 1929, there were 243 members of the A. S. T. M. who became members of the international association, 38 being companies and 205 individual members.

To Take Part in World Engineering Congress

The executive committee has accepted an invitation for the society to participate in the World Engineering Congress to be held in Tokio, Japan, this year, under the sponsorship of the Japanese Government. As part of the American participation in the congress, Prof. H. F. Moore, University of Illinois, and past-president of the society, has prepared a paper on "Engineering Materials" for presentation at the congress.

Marburg Lecturer Brings Physicist and Engineer Closer Together

A FEATURE in the last three years has been the Edgar Marburg lecture, founded in 1926 in memory of the society's first secretary.

This year Dr. Saul Dushman was selected to deliver the fourth lecture. The choice was eminently fitting, the address bringing out the close relationship between the physicist and the engineer. Dr. Dushman is assistant director of the research laboratory of the General Electric Co., Schenectady, N. Y. Educated at the University of Toronto, from which he was graduated in 1904, he was a lecturer there before joining the research staff of the General Electric Co. in 1912. The subject of his lecture was "The Nature of Cohesive Forces in Solids." An abstract follows:

The Bohr theory of the origin of spectra led to definite conclusions regarding the arrangement of electrons in the atoms of the different elements. It has been shown that the electronic configuration and a large number of properties of the elements vary in a periodic manner with the atomic number. At least four cohesional properties show this periodic relation with electronic arrangement. These are as follows: The reciprocal of the melting point on the absolute scale, the atomic volume, and coefficients of compressibility and expansion.

Ductility and Malleability of Metals Dependent on Structure

The crystal structure of pure metals also shows a similar connection with electronic arrangements, and certain properties, such as ductility and malleability, are observed to be intimately dependent upon the type of lattice structure. The fact that atoms are arranged in regular lattice formations leads to revised views on the nature of so-called secondary valence of forces. Cohesional forces are essentially no different from chemical forces except in order of magnitude.

While it is not possible as yet to formulate a theory of cohesion in solids based upon atomic structure, it is possible to calculate the magnitude of such forces by introducing plausible assumptions regarding the laws of attraction and repulsion between atoms. As shown by Grumeisen for the case of pure metals and by Born for ionic lattices (such as rock salt), there must exist definite relations between the theoretical cohesive force between atoms and such experimentally observed values as density, latent heat of evaporation and coefficients of expansion and compressibility. The cohesive forces, calculated on the basis of this theory, are found to be from 10 to 100 times greater than the rupture strengths actually observed.

In explanation of this discrepancy, Griffiths and Smekal suggested the presence of fine cracks, crevices or inhomogeneities in the crystal structure. Various observations made by these and other investigators are found to be in good accord with such an assumption. The theory has been extended quite recently by Zwicky and evidence adduced to show that the distribution of such cracks must be governed by the lattice structure and that this accounts for the fairly definite values actually obtained technically for rupture strength of different materials.

Most interesting results have been obtained from investigations on the tensile behavior of single crystals. The application of such results to the observations in the case of polycrystalline materials leads to similar views as those postulated by Griffiths, Smekal and Zwicky.

Cohesive Forces and Strength of Metals at High Temperatures

The effect of temperature on the rupture strength is discussed at length by Dr. Dushman. A plot of the observed data against temperature shows two distinct portions, one below a definite inflection temperature which is approximately linear, and the other, which extends from the inflection temperature upward, shows a very much more rapid decrease in strength with temperature. In explanation of these observations an extension is suggested of the theory previously postulated by Jeffries and Archer with regard to the relative strength of crystalline and intercrystalline material. The inflection point in the plot of rupture strength versus temperature is probably to be identified with the so-called equi-cohesive temperature. Above this point deformation occurs by viscous flow, and consequently the rate of decrease in tensile strength with temperature is dependent upon the rate of decrease with increase in temperature coefficient of viscosity.

Analogy with other reactions, both chemical and physical, whose rates change with temperature in the same manner suggests that, from the temperature coefficient of the rupture strength, it should be possible to calculate the energy required to cause relative translational motion of atoms or grains such as occurs in plastic flow of solids. The values of the energy thus calculated are found to lie between the heats of fusion and evaporation. The nature of the previous treatment of the metal and other factors affect the value of the energy as actually observed.

Similarly, from the rate of grain growth, rate of diffusion, electrolytic conductivity of salts, viscosity of glass, rate of flow of metals, each of which changes rapidly with temperature, it is possible to calculate the energy involved in the reaction. Thus the study of the effect of temperature on all these phenomena furnishes a means of determining the particular type of cohesive forces which are involved.

Marburg Lecturer and Dudley Medalists

SAUL DUSHMAN L. W. SPRING J. J. KANTER

Two Recipients of the Dudley Medal

IT is customary each year to award the Charles B. Dudley medal to the author or authors of the paper adjudged to be the best one presented at the previous annual convention. The third award was made this year to J. J. Kanter and L. W. Spring, joint authors of the paper, "Long-Time Flow Tests of Carbon Steels at Various Temperatures with Particular Reference to Stresses Below the Proportional Limit."

During the last four years Mr. Kanter, who is testing engineer of the Crane Co., Chicago, has been engaged in the development of creep test apparatus and in investigations in this important field of high temperature

President, Vice-President and Retiring President

T. D. LYNCH

F. O. CLEMENTS

G. W. THOMPSON

testing of metals. Mr. Spring is active in the A. S. T. M., A. S. S. T., and other technical societies, and is chief chemist and metallurgist of the Crane Co. His technical articles in chemical and physical testing have been numerous.

Presentation of the medals followed the Marburg lecture. President G. W. Thompson made the presentation speeches, and both recipients responded, Mr. Spring outlining some facts leading up to the work referred to in the paper and giving some history of high temperature testing.

Standardization and Good Will

IN his annual address as the retiring president, G. W. Thompson, chief chemist, National Lead Co., New York, took as his subject "Standardization and Good Will." Some of the chief points he made were as follows:

The President of the United States, Herbert Hoover, when he was Secretary of Commerce made many speeches and issued many communications to the public in the general advocacy of standardization. While not attempting to present Mr. Hoover's views in detail, there is one thought that runs through all of his addresses on this subject to which I would direct your attention. In the United States, industries are conducted on a large scale. In order that these industries should be profitable it is necessary, so far as is practicable, that the products manufactured be simplified as to number and kind so that large production of unit types of products can be made day in and day out. In order to do this the products must be standardized to meet the demands of the consumer. The only limitation to this point of view is that the standards should not go so far as to prevent the obtainment by the consumer of materials that are best suited to his needs.

If there ever was a democratic organization in the best sense of the term, our society is one. In theory at least, and actually I believe, our committees are made up of those who have common ends approached from different standpoints. Our committee meetings are in principle those of the round table where, while you have nominal chairmen, there is no head nor foot but all sit down at the table with equality. If it ever so happened that our committee meetings became in the nature of the long table with a head and a foot, unfortunate it would be for our society.

What is more, our society has wide-open doors and if any consumer, or group of consumers, has an interest in the standardization of materials for engineering he finds the spirit of our society welcoming him as a member, and the same is true with regard to the producers.

One Great Difficulty Confronting the Society

We may as well speak openly about one of the great difficulties that confronts our society. There are a large number of industrial organizations in this country that are inclined to resist standardization on the ground that it substitutes something for the good will their organizations are trying to build up by the expenditure of large sums of money for advertising. They consider that standardization and the building up of good will are incompatible. To a certain extent I sympathize with this view although my better sense condemns it in so far as it relates to the standards of this society.

So far as consumers are concerned, they have specifications of their own if they are not more generally standardized by a body such as ours. Therefore, standardization by our society, as it affects the large consumer, substitutes general standards for isolated standards. The large consumer will generally buy in the open market on more or less of a competitive basis. He may have his preferences and he may prefer to give his orders to certain producers, but this depends largely upon other things being equal, such as price and quality of product. I must emphasize, however, that what I say has relation only to those materials which are bought in relatively large quantities for specific purposes.

What I say does not relate to the purchase of small quantities of material for very indefinite purposes which materials have been found by experiment and use to satisfy the needs of the consumer. It is not for me to draw the line between these two groups of materials and their uses but that there is a distinction between them is clear. Of course, specification of materials used in large quantities will also cover the use of these materials in small quantities, which is of advantage to the general public.

Let us think on the other hand as to the effect upon the producer and the good will he is endeavoring to build up when he has a record of having furnished some standard product to a large consumer year in and year out with extreme satisfaction to the consumer. It is presumed that the consumer has examined carefully the products delivered to him by this producer. The weights and volumes have been checked, analyses have been made of the product, and this product has been uniformly found to conform to standard specifications. Does this add anything to the value of the good will of the producer? I am sure it does add a great deal to that value.

All consumers naturally want to buy in the cheapest market. This desire exists whether there are standard specifications or not. Suppose there are no standard specifications, what will the consumer do? He will buy in the cheap market just the same, but he will be far more subject to those blandishments of the salesmen with which we have in the past been too familiar.

It is said that standard specifications are often compromises. As a statement of fact this is undoubtedly true. As a basis of criticism it is unsound. A standard specification, whether it is good or bad, has only the same kind of value which attaches to everything else. It is good or bad according to the way it works. All specifications, when we study the history of them, began with what are called "bad specifications," or, as some would say, imperfect specifications, using what I consider a very improper designation. It is the order of progress that what we did yesterday should be bad and imperfect as compared with what we do today, but we must remember that what we do today is based upon what we did yesterday.

Standard Specifications Subject to Change

Standard specifications are not fixed things; they are constantly subject to change. They should not be adopted prematurely, neither should they be amended prematurely, but they should show constant growth. In our society, with our standing committees made up of both producers and consumers constantly studying the problems covered by specifications, there is a quick response as to the efficiency of specifications. Sometimes producers and sometimes consumers will not use specifications. Time only can tell whether they are right or whether they are wrong. As to the criticism that standard specifications are usually compromises, that we admit and we admit cheerfully in that we do not know of anything in life that is not a compromise.

Permit me to sum up this talk with these few words. Our society occupies an impregnable position, impregnable so long as we perform our functions rationally, justly, and with a continuous process of development. We have no desire to break down any good structure in industrial life. Our object is to build as far as we can on sound foundations, going only as far and as fast as we feel that the circumstances justify. We aim to move constantly forward, requiring no push or prod, for our aims are clear and our methods of procedure have stood the test of time. If, however, our society would live up to its great purpose none of its members and none of its committees must stand in the way of general progress along the lines of proper development. I trust that our future will far exceed in brilliance our past in the service which we are rendering to in-

New Directors for Next Year

CHARLES R. HOOK

G. E. WARREN

H. E. SMITH

G. B. HAVEN

dustry, to our country, and to the world at large.

New Work of Some Prominent Committees

AMONG the many committees whose annual reports were adopted, several should be mentioned.

Committee A-1 on steel, the society's largest one, presented new specifications for heat-treated carbon steel helical springs and a complete revision of the standard specifications for carbon steel forgings for locomotives. The immediate adoption of revisions of the standard specifications for carbon and alloy steel blooms, billets and slabs for forgings and for wrought solid carbon steel wheels for steam railroad service was recommended.

An Old Contest Revised and Settled

Revival of an old contest was brought to the floor of the convention. When the advancement to standard of tentative standard specifications for carbon steel castings for valves, flanges and fittings for high temperature service (A95-28T) was brought up for adoption, there were decided objections.

For six years the question of discriminating against the converter process for making such castings and of adopting definite chemical limits has been debated with some bitterness. This year the familiar arguments were again voiced. John Howe Hall, A. H. Jameson, and Prof. Bradley Stoughton argued against the adoption of the specifications as standard while L. W. Spring, V. T. Malcolm and R. A. Bull favored the adoption. When the final vote was taken, 43 favored the advancement to standard with 11 voting negative.

Splendid Work of Committee on Cast Iron

Undoubtedly one of the most active committees in the ferrous phase of the society's work is now A-3 on cast iron. During the year it successfully organized a symposium on the engineering properties of cast iron, which was a valuable contribution to a revival of interest in this product. A review of this symposium is printed on other pages. Too high praise cannot be voiced for this effort.

Arbitration Bar Adopted

After several years of investigation and debate, a committee recommended for adoption as standard the specifications for the arbitration test bar and tension test specimen as a revision of standard specification for gray iron castings, cast iron pipe and fittings and high-test gray iron castings. It also recommended new specifications for gray iron castings for valves, flanges and pipe fittings, as well as for chilled tread cast iron car wheels, as a revision of the present standard specifications.

Tin and Arsenic Harmful to High-Speed Steel

Report of the research committee on the effect that tin and arsenic have on high-speed tool steel, was that special heats had been made containing respectively 0.40 per cent of arsenic and 0.40 per cent tin. Service tests of tools made of this steel,

New Officers and Directors for 1929-1930

President:

T. D. Lynch, consulting metallurgical engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Vice-President:

F. O. Clements, technical director, Research Laboratories, General Motors Corporation, Detroit.

Members of Executive Committee:

G. B. Haven, professor of machine design, in charge of textile laboratory, Massachusetts Institute of Technology, Cambridge, Mass.

C. R. Hook, vice-president and general manager, American Rolling Mills Co., Middletown, Ohio.

H. E. Smith, engineer of materials, New York Central Lines, New York.

G. E. Warren, assistant general manager, Portland Cement Association, Chicago.

such as cutters, reamers and twist drills, showed conclusively that such steel was unsuited for twist drills, and that it was detrimental in service for cutters and reamers.

High Temperature Committee to Be Reorganized

A report by the joint research committees of A. S. T. M. and A. S. M. E. on the effect of temperature on the properties of metals was not made. This committee is undergoing a reorganization. Chairman G. W. Swaathoff has resigned, and C. E. MacQuigg has been selected as temporary chairman, pending a permanent organization.

At some of the sessions on metals several papers of importance were presented. There were three in particular on fatigue of metals, and one by L. W. Fry, Standard Steel Co., Burnham, Pa., on "The Effect of Reduction from Ingot to Forging on Steel Forgings." These will be briefly reviewed in later issues of THE IRON AGE.

There were two sessions on nonferrous metals, at which various committee reports as well as original papers were presented. These will be the subject of review in later issues of THE IRON AGE.

Prominent Men as New Officers

AS president for the next year, the society has selected T. D. Lynch, consulting metallurgical engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. He was graduated from West Virginia University in 1891. From 1922 to 1923, he was president of the American Society for Steel Treating. He is also a member of the Engineering Society of Western Pennsylvania and of the International Society for Testing Materials and is active in the committee work of the American Foundrymen's Association and of the American Standards Association.

For vice-president, F. O. Clements has been elected. He is technical director, research laboratories, General Motors Corporation, Detroit. He is a graduate of Otterbein College, Westerville, Ohio, in 1896. He has been chemist successively for the Pennsylvania Railroad, Union Pacific Railroad, National Cash Register Co. (1905 to 1917) as chief chemist and engineer of tests, and director of research, Dayton Metal Products Co., Dayton, Ohio. He has held his present position since 1920. He is a member of the American Chemical Society, the A. S. T. M., the A. A. A. S., the A. S. S. T., the American Electrochemical Society, the Institute of Metals (Britain) and the S. A. E.

Four new directors were chosen, one of whom is G. B. Haven, who is professor of machine design, Massachusetts Institute of Technology, was a graduate of that institution in 1894. For 11 years he was associated with the late Prof. Peter Schwab. He has been in his present position since 1910, in charge of textile research.

Another director is Charles R. Hook, vice-president and general manager, American Rolling Mill Co., Middletown, Ohio. Graduated from the Walnut Hills High School of Cincinnati, he secured his first position as office boy with the Cincinnati Rolling Mill & Tin Plate Co. Next he became night superintendent of the company he has been with ever since. He is president of several banks and a director in several corporations.

The third director is H. E. Smith, well known among railroad men. He was graduated in chemistry from the Massachusetts Institute of Technology. He has been connected with several railroads, particularly the New York Central, of which he is now engineer of materials in charge of specifications and special investigations of materials.

As the fourth new director, the society has chosen G. E. Warren, assistant general manager, Portland Cement Association, Chicago. He was graduated from the University of Illinois and has served on several important cement committees.

Metal Lath Makers Adopt Trade Rules

WASHINGTON, June 29.—A code trade practice, including 24 rules, was adopted for the metal lath industry here on Thursday when the Associated Metal Lath Manufacturers held a trade practice conference with the Federal Trade Commission, represented by Commissioner W. E. Humphrey and M. Markham Flannery, director, Trade Practice Conference Division. The rules set up at the conference cover largely the scope that is treated in such conferences. Breach of contract, misbranding or misrepresentation, misrepresenting competitors' prices, defamation of competitors, secret rebates and selling below cost were among practices that were condemned.

Approval was given to the principle of a reasonable differential in prices charged to dealers and to contractors when sold equal qualities and in substantially equal amounts, and to the practice of each individual member independently publishing and circulating his own current prices, and also notices of all advances, declines or other changes in price. The principle that there shall be no discrimination as between purchasers of the same class was adopted, with the provision that there was no obligation to maintain any price any length of time.

Sale or offering for sale of any product of the industry at carload prices when shipped in less-than-carload quantities was condemned as an unfair trade practice, as was the sale or offering for sale of any product under any form of guarantee, to the purchaser or proposed purchaser, against advance or protection against decline in prices. Blanket contracts were condemned, while approval was given to standard contracts. The practice of dumping surplus stock of metal lath and accessories, at low discriminatory prices, was declared to be an unfair method of competition.

Tests of Interlocking Steel System

Laboratory tests at the Rensselaer Polytechnic Institute, Troy, N. Y., have been made of the Wait interlocking steel system, consisting of two-story bents and of column construction. The tests were under the direction of Prof. T. R. Lawson, head of the department of civil engineering. An illustrated pamphlet describing the system and the tests to which the members were subjected has been published by Wesley Wait, Newburgh, N. Y.

Comparative tests were made on two-story bents of riveted structures, interlocked structures and interlocked welded structures. In each case the test was carried to the point where some member buckled.

Production and Shipment of Raw Materials and Finished Products in May

	May, 1929	April, 1929	May, 1928
Enameled sanitary ware shipments (a), pieces	341,927	348,385	461,124
Babbitt metal (a), consumption, lb.	5,472,008	6,046,445	4,606,899
Steel boilers, new orders: (a)			
Number	1,749	1,706	1,836
Heating surface, sq. ft.	2,143,257	1,769,427	1,661,173
Steel furniture: (a)			
New orders	$2,845,826	$2,880,395	$3,085,638
New orders, 5 months	15,562,878	.....	15,828,337
Shipments	2,791,306	2,844,939	3,213,291
Steel shelving: (a)			
New orders	1,127,431 (b)	1,095,329	732,921
New orders, 5 months	5,387,524	.....	3,824,735
Shipments	990,651	1,131,362 (c)	768,488
Electric power production (d)	8,093,373	7,881,620	.....
Made by water-power (d)	3,485,021	3,285,154	.....
Bituminous coal mined (e), net tons	40,172,000	36,888,000	36,624,000
Anthracite mined (e), net tons	6,308,000	6,441,000	8,124,000

(a) United States Department of Commerce.
(b) Second largest total ever recorded; exceeded only by March, with $1,145,632.
(c) Largest total ever shipped.
(d) United States Geological Survey; figures represent thousands of kwhr.
(e) United States Bureau of Mines.

Foundrymen Hold London Meeting

Representatives of Many Nations at Third International Congress—Test Bar Correlation and Alloy Irons Fully Discussed—Large Exhibitions a Feature

(*Special Correspondence*)

LONDON, ENGLAND, June 17.—The Third International Foundrymen's Congress was held in London from June 11 to 15, at the same time as the twenty-sixth annual convention of the Institute of British Foundrymen, and in conjunction with the largest working exhibitions of foundry and shop equipment ever held in Europe. Many of the delegates, in particular those from America, arrived in London last month.

Foundrymen from America Banqueted

The American delegation, among whom were S. T. Johnson, president; Fred Erb, vice-president; S. W. Utley, past-president; C. E. Hoyt, secretary, and R. E. Kennedy, technical secretary of the American Foundrymen's Association, were welcomed on their arrival in London at a banquet held on May 23, over which Sir Hugo Hirst presided. This was followed by an extensive tour of the industrial and other parts of the country, which lasted until June 9, and in the course of which the delegates visited, as the guests of the local branches of the Institute of British Foundrymen, Birmingham and Coventry, Manchester, Oldham and district, Glasgow, Edinburgh and Sheffield, in addition to Shakespeare's country, the Derby and Matlock and the lake districts. The Congress was preceded on Monday, June 10, by the annual general meeting of the Institute of British Foundrymen, when Wesley Lambert was elected president for the coming year, with F. P. Wilson and A. Harley, vice-presidents.

Two Medals Presented

The congress which has just closed is the third of the series of triennial international foundrymen's congresses, the first of which was held in Paris in 1923 and the second in Detroit in 1926. It opened on June 11 in the Grand Council Chamber of the historic Guildhall in London, which was crowded with delegates from Great Britain, and many countries overseas. This in itself is a notable tribute to the importance of the foundry industry, and to the improved status which has come about as a result of the untiring efforts of a number of able and farseeing men in the industry.

Sir Kynaston Studd, Lord Mayor of London, extended a cordial welcome to the delegates, and presented two medals. The first, a gold medal, was awarded to Prof. T. Turner, late professor of metallurgy, University of Birmingham, and a past-president of the Institute of Metals, as a permanent souvenir of a presentation made to him two years ago, on behalf of the Institute of British Foundrymen and the British Cast Iron Research Association, on the occasion of his retirement from his professorial duties at Birmingham. Professor Turner returned thanks for this expression of approval of the work he had been able to do, and also took the opportunity to thank his American friends for having presented to him, through his son, at Detroit, nearly three years ago, their Siemens medal.

The second medal, the Oliver Stubbs Medal, was presented to the president, Wesley Lambert. This is awarded annually to the member of the Institute of British Foundrymen who has contributed the most meritorious services during the year, and it is the first time the medal has been awarded to a representative of the non-ferrous side of the industry.

A pleasant feature of the Guildhall meeting was the delivery of short addresses by the heads of delegations from the various countries overseas. The countries the representatives of which spoke were America, Germany, France, Belgium, Italy, Holland, Poland, Spain, Luxemburg, Czecho-Slovakia and Denmark.

Progress of the Foundry Traced by the President

In his presidential address Wesley Lambert traced the progress of the foundry industry through improvement in building design and construction, planning and layout of the foundry, and the installation of machinery. Touching upon progress in the art of molding, Mr. Lambert said that the journeyman molder had progressed so far today that he was making high-duty complicated castings with intricate cored parts which the old-time craftsman would have considered to be beyond the bounds of possibility.

Commenting upon the development of the aluminum casting industry, the president predicted that in the not very distant future even lighter alloys, mainly composed of magnesium, would become a serious rival for the engineer's favor. Chemical and superheat plant engineers are giving enthusiastic testimony to the progress which had been attained in the fabrication of special irons and non-ferrous alloys to meet their particular requirements.

One of the most outstanding applications in foundry practice is the extended use of oil-sand cores which have rendered possible the mass production of intricately-cored castings which at one time would have taxed the skill of even the most painstaking craftsman.

The laboratory side of the modern foundry has also progressed considerably, along with technical progress, and what is of equal importance is the great improvement that has taken place in the general design of the buildings and of their equipment for the welfare of the workers.

Immense Possibilities for the Future

The future of the foundry industry holds immense possibilities, said the president. It is common knowledge that in so comparatively recent times as the reign of Queen Elizabeth only seven or eight metals were known, of which only four, iron, copper, tin and zinc, were in use for the compounding of constructional — as distinct from ornamental—alloys, whereas today, as a result of intensive scientific research, 61 metals are now available, and, year by year, one or more of the previously rarely used metals is being harnessed to the service of mankind in the form of alloys for industrial uses, the immense possibilities of the utilization in the foundry of these later discovered metals affords subject matter for fascinating conjecture.

It may be seen, by the use of a simple formula, that if a complete series of binary alloys of all the known metals were compounded in merely one uniform proportion, such as 50:50, the number of alloys resulting would be 1830; if ternary—three-metal—alloys were made also in one definite proportion only, the number of different alloys would total 35,990. To go but one step further, if a complete series of quartenary, or four-metal, alloys, in one uniform proportion, such as 25 per cent of each of the four metals constituting any one

alloy were attempted, 521,855 separate alloys would have to be produced before each of the known metals was thus proportionately employed in its own group in this series of alloys.

In concluding his address, the president paid a tribute to the foundrymen from overseas who were attending the congress, all of whom had generously contributed toward improving the condition, the efficiency, and the output of the industry. He hoped to see closer association among institutes and organized bodies representing the foundry industry of the world, which would result in raising that industry to the high status which its science and craftsmanship so fully merited.

Some of the Technical Papers

Abstracts of some of the many papers and discussions presented at the various sessions are as follows:

Inter-Relationships in Gray Iron Metallurgy

PRESENTED on behalf of the American Foundrymen's Association by J. W. Bolton, the Lunkenheimer Co., Cincinnati, the paper on the above subject deals with schemes of correlation, and discusses two important problems:

(1) Study of the influence of manufacturing practice on given grades of cast iron; and

(2) Relationship of test results to engineering properties of the casting.

Tne first problem is solved as follows: Arrange a classification of irons according to composition: and make an intensive study of each grade. In this study it is necessary to give consideration to the influence of the four following factors:

Chemical composition of metal, initial, incidental and final;

Structural, mechanical and chemical make-up of charge (all materials);

Melting process, conditions chemical, thermal and mechanical; and

Thermal, chemical and mechanical history, furnace spout to finish casting.

On the second problem two viewpoints predominate—one that of many British and Americans, who believe that test results can be correlated so that properties of castings may be predicted therefrom with reasonable accuracy, and the other that of the French and other Continental investigators, who hold that tests must be made on the castings themselves.

It is logical to expect that if a ladle of the same grade of iron is divided into two parts and each part subjected to exactly the same treatment, the two resultant materials will be the same.

Correlation Necessary or Research Is Futile

Reasonable correlation of tests to the properties of the castings themselves must be established or cast-iron research is futile. That it is possible to tell a great deal about the quality of the metal in the casting, is evident from the following considerations:

(a) Many working properties of steel and other metals are predicted regularly from tests. Granting the limitations of the tests and the difficulty of their exact interpretation, which, by the way, applies to all materials, no one would deny that great progress has been made by use of tests. In a general way tests are used every day to determine properties of commercial metals.

(b) If in two or more cases exactly the same grade of material is accorded the same or equivalent treatment, the altered materials will still be the same, one to another.

(c) Test bars are castings of certain specified shape and dimensions. If castings and test bars all of the same analysis and cooling rate are poured at the same time from the same material, one would expect to find similar metal in each. The problems encountered are: (1) to make test bars whose cooling rates are like those of the castings, and (2) to use common sense in making allowance for peculiarities in design and foundry practice—particularly those which may promote shrinkage or other defects and those which call for slow or fast pouring of castings.

(d) These points are borne out because the foundryman of wide experience can take an analysis and a result on one of the so-called arbitration test bars and many times predict quite closely what the iron in the casting will be like.

It then is possible to solve the second problem—relationship of test results to the properties of the casting. What is needed is cooperation in accumulation and interpretation of sufficient data. Careful study must be made of test methods. In the correlation shown in the examples above, the general agreement becomes more remarkable when it is considered that (a) the metal flow in the castings may be slower than in the bar; (b) that the machined tensile bar is in case of the castings closer to the cooling surfaces than in the tensile bars—thus neglecting the well-known and demonstrated differences due to cooling gradients of unlike sections of similar volume surface-area relationship. This is most apparent in larger sections.

The usual commercial impracticability of the French scheme of trepanning a small shear sample from actual castings appears a barrier to the widespread use of this method. In America, attempts to get similar tests into specifications for steel castings have been opposed. There may be some merit in the idea of cast-on bars for certain types of casting. The work of the late George K. Elliott, Willard Rother, and the writer demonstrate certain objectionable features in the original Fremont test. This test, as proposed, was hardly precise enough for use in commercial specifications. The machine did not seem sufficiently rigid and the method of preparation of the test bar by a hollow drill is open to criticism.

Accurately-machined bars are an absolute necessity, and a rigid and accurate machine is needed. The test piece proposed was too small to be representative of the general properties of the iron. On the other hand, the basic idea of the French engineers is very good. With proper modification, the shear test is quite useful in research work.

Larger Test Specimens Necessary, Says American

Referring to the trepanning of specimens and the attempt to correlate the results of tests on bars taken from the castings and on cast specimens, R. F. Harrington, metallurgist, Hunt-Spiller Mfg. Corporation, Boston, said it is becoming more fully realized that it is necessary to use larger test specimens than had been used hitherto, in order that the results obtained may be more strictly comparable. He anticipated that the A. F. A. will be able to shed more light on that particular subject. He was glad that Mr. Bolton had emphasized, above all, the fact that foundrymen have to sell castings, and not test bars, and that they are concerned to turn out proper castings by the adoption of sound foundry methods.

J. T. MacKenzie, chief chemist, American Cast Iron Pipe Co., Birmingham, Ala., said that the work of the A. F. A.'s committee on gray cast iron is concerned with the examination of the properties of the iron in the molten state, with the idea of determining the properties which make for the production of sound castings or otherwise. They have just completed some work of considerable magnitude on the determination of the temperatures, and have shown up the faults of the optical pyrometer in that regard. Following that, they are engaged upon a study of the shrinkage of cast iron in the freezing range. If they are successful in developing a test for that, it will be extended to the contraction from the freezing point to room temperature, which will include shrinkage as we now know it. Mr. MacKenzie said he could not emphasize too strongly his belief that the soundness of the casting had more to do with the quality of the cast iron than with the tensile strength of the test bar.

Results put forward in the paper represent a considerable amount of practical work, and, combined with it, an attempt at scientific correlation, said Prof. T. Turner, Birmingham, England. In earlier investigations of subjects of this kind we have been content to say that a thing is good or bad, or very good or very bad, and we have had no quantitative values. We do not become scientific until we can express many of the properties

in figures, but he uttered the warning that if we do use figures, we must be sure that they are correct, because there is nothing more misleading than wrong figures.

Intermediate Forms of Graphite Exist

Discussing the amount and form of graphite in the castings, Professor Turner said that graphite is sometimes very fine indeed, like soot; sometimes it is in the form of curved flakes, and sometimes in the form of flat flakes. Those are simple kinds of graphite, but there are also intermediate qualities, each of which corresponds to entirely different physical properties in the material, and when describing graphite one should endeavor to state to which class it belongs, or whether it is a mixture of more than one class. Some graphite is so small that it can hardly be seen with the aid of a microscope, while some is in the form of flakes almost as large as one's finger nail, and there are other sizes between these extremes. He urged that there should be evolved some method of classifying graphite microscopically, as, for instance, in terms of inches or millimeters.

That the paper was a condemnation of the use of test pieces cast separately from the actual castings was suggested by E. V. Ronceray of France. He was glad to note that the author attached great importance to the soundness of castings, because at the Foundry High School in France the students are taught that the first four important factors are (1) soundness; (2) tensile strength or internal strain, (3) strength of material and (4) cost.

The author's remarks as to the importance of the melting conditions were confirmed by J. G. Pearce, director, British Cast Iron Research Association. Discussing the problem of the volume/surface-area ratio, he said he had carried out some work on the mechanical properties of cylindrical bars, and had tried to relate the strength of the bars of different thicknesses to the diameter. The cylindrical bar is a very simple casting, and the ratio might work in simple cases, but, in regard to the more complicated castings, he was not so optimistic.

Excellent American Work on Correlation

After paying a tribute to the American foundrymen for their wonderful work on correlation, J. E. Fletcher, consultant, British Cast Iron Research Association, said that the research association has been trying to correlate as far as it could the various properties of cast iron as influenced by cooling rate and composition. There is one phase of this subject, however, which is sometimes left out of consideration, namely, the conditions of the making of the raw material in the blast furnace, which influence in such a serious fashion the ordinary casting, and he suggested that foundrymen should try to obtain from the blast furnace people a good deal more information than they have hitherto vouchsafed to give.

Discussing the test results relationship, John Shaw, consultant, Southsea, England, said he would not care to accept the tensile result of a bar of the same composition as the casting, if that bar had not been cast out of the same ladle of metal; neither would a shear result converted into a tensile be acceptable. While it might be granted that, under the very closely controlled conditions specified by Mr. Bolton, approximations in both cases are possible, and their use for works information and research of great value, these approximations cannot be acceptable to the buyer of the casting.

Chromium, Manganese and Nickel in Cast Iron

INVESTIGATIONS carried out in the Works of Scott's Shipbuilding & Engineering Co., Ltd., Greenock, said Dr. J. W. Donaldson, in a paper "The Influence of Chromium on Cast Iron," show that chromium added to gray cast iron in quantities up to 0.90 per cent increases the stability of the combined carbon at temperatures up to 550 deg. C. This increase in stability is probably due to the presence of chromium carbide in the cementite of the pearlite, and is reflected in the increased strength both at ordinary and elevated temperatures and in the Brinell hardness. Better heat-resisting irons are, therefore, obtained, but there is difficulty in machining irons with over 0.4 per cent of chromium.

Chromium and Manganese as Alloys

Influence of chromium on volume changes at temperatures below the critical range is erratic, but the general effect is to produce a contraction. The nature of this contraction is difficult to explain or define. With chromium up to 0.4 per cent the thermal conductivity is increased by about 8 per cent. Small additions of chromium reduce very slightly the corrosion of gray cast iron. The effect is most noticeable with sea water, and to a lesser extent with strong acids. With weak acid, tap water, and ammonium chloride little advantage is gained.

Gray cast irons, which contain only traces of sulphur and manganese have abnormally high combined-carbon contents, e.g., 1.3 per cent, says Dr. A. L. Norbury in a paper, "Manganese in Cast Iron." Increasing the manganese from traces up to 0.3 per cent causes the combined carbon to drop to normal (e.g., 0.8 per cent), and causes a decrease in the tendency to chill. Further additions of manganese up to 1 or 2 per cent tend to increase the combined carbon and increase the tendency to chill. The explanation put forward is that the graphitizing action, found on increasing the manganese from 0 to 0.3 per cent, is an indirect one due to the manganese combining with and nullifying the carbide-stabilizing action of traces of iron sulphide. It appears that about 0.3 per cent manganese in excess of the amount theoretically required to form MnS is required to do this.

Approximately the same excess of manganese, e.g., 0.3 per cent, is required in irons containing higher sulphur contents, e.g., 0.1 and 0.2 per cent sulphur. The high combined-carbon contents found in gray irons containing only traces of manganese and sulphur are due to hard spots of cementite — austenite — iron-carbide eutectic plus secondary cementite, and to patches of secondary cementite, stabilized in each case by traces of iron sulphide. Apart from its indirect graphitizing-action, due to its combining with and neutralizing iron sulphide, the normal action of manganese is to stabilize iron carbide and to increase the tendency to chill.

Application of Nickel in Cast Iron

Its equalizing action on the structure of thick and thin sections of a casting is the basis of the application of nickel in cast iron, said Dr. A. B. Everest. It has been established that whereas an ordinary iron cast in a ⅛-in. section will show a white chilled structure, at the same time this iron will be open and soft in a heavier section of 1 in. or more. Nevertheless, in the corresponding nickel iron, the tendency to chilling is eliminated, so that the thin section is gray and machinable and at the same time the heavier section is appreciably hardened, owing particularly to the action of nickel on the matrix of the iron. Records show that in some cases a hardness difference of about 200 Brinell between the ⅛-in. and 1-in. section of a casting may be reduced to about 20 points in a casting suitably alloyed with nickel, and at the same time the iron is appreciably hardened and strengthened in the heavier sections.

The practical result of this equalization is that the nickel iron shows a much greater latitude as compared with the ordinary iron, so that uniform structure may be obtained over a wide range of section thickness. This has an important application in the foundry in enabling certain diffi-

cult castings to be made satisfactorily, in which high hardness and strength is required in heavy sections; or sections which cool slowly owing to casting design, while the metal quality is determined by the machinability of some thin section on the outside of the casting.

As an example, reference is made to the case of motor cylinder blocks, where the hardness and closeness of the cylinder bores and of the valve seats are of paramount importance in obtaining maximum wear, and yet the quality of iron is often determined by the machining requirements on some small water-exit boss situated in the middle of a thin section water-jacket. The use of nickel in cast iron tends toward a general uniformity of product, which is of great value in production work where variation in machinability is to be avoided.

These three papers were discussed together.

Little Progress in Control of Shrinkage

It would be useful to hear from Dr. Norbury something about the shrinkage in gray cast iron which gives trouble in the foundry, viz., draw holes shrinkages, said Mr. Field. A certain amount of work has been done by Cook and others but, in general, foundry practice has progressed little in the past 20 years in the control of draws and shrinkages through the analysis of the iron used. This is undoubtedly one of the greatest difficulties which the general iron founder, making a large range of work, has to deal with. Mr. Field said he believed it was generally recognized that Derbyshire iron gives less trouble with draws and shrinkage than Northamptonshire iron. He has proved this time after time in separate experimental heats running into hundreds, and has come to the conclusion that the manganese in the Derbyshire iron, which is greater than in the Northamptonshire iron, has a great deal to do with the immunity of the Derbyshire iron from shrinkage.

Favorable Results from Nickel in America

R. S. MacPherran, chief chemist, Allis-Chalmers Mfg. Co., Milwaukee, remarked that experience in the United States entirely confirmed statements by Dr. Everest. From ½ to 1 per cent nickel is used in castings for cylinder liners, crank-heads, etc., and in that way castings had been obtained which otherwise would not have been machinable. By adding 1 per cent nickel something like 0.5 per cent silicon is taken out and a machinable casting obtained. So far there has not yet been developed in the United States a satisfactory machine for testing wear in cylinders or frictional wear generally. As regards shrinkage, this had been reduced in the United States by using a lower phosphorus content. In that way the good castings had been increased, keeping the phosphorus below 0.2 per cent.

That mere reduction of silicon to any extent is necessarily a step in the direction of increasing solidity and the absence of porosity cannot be claimed as a general proposition, said J. Longden. There must be a certain minimum line beyond which there is no reduction of porosity. It does not follow that the reduction of the silicon from 1.3 to 1.2 or 1.1 per cent and the addition of a certain percentage of nickel will reduce the porosity. He said he had recently cast a gear blank without reducing the silicon but adding about 2 per cent nickel, he was sorry to say, porosity showed itself in the rim without any additional work by chilling.

R. F. Harrington, A. F. A., said he was a firm believer in the use of nickel for the purpose of removing internal shrinkage. He believed nickel had its definite application as suggested by Dr. Everest in that it prevented waste castings by providing a more uniform structure.

Adding Manganese to Cast Iron Advantageous

That further evidence has been published of the advantage of adding manganese to cast iron, especially in the case of thick sections, was appreciated by John Shaw. Nickel is being used by him for special purposes and he said that, in the case of cylinders for air compressors which had to withstand a pressure of 3000 lb., whereas with a specially refined iron bad results were obtained, the addition of 1 per cent of nickel enabled castings to be obtained which indicated no leakage under this test.

H. J. Young, speaking with regard to nickel, said he was recently at a meeting where there were some chief chemists and big founders and one man said he had put in ½ per cent to 1 per cent of nickel into his castings and had reduced his costs from 10s. to 5s. throughout his foundry. That sounded very good but another chemist from an equally large foundry said it was "all bunkum" and that he had used nickel but had not got rid of the wasters.

Definite Ratio of Manganese to Sulphur Advantageous

Thirty-three years ago, F. J. Cook said, he found that manganese caused hardness, and decided that if manganese were three times the sulphur with a maximum of 0.4, the sulphur being 0.12, and the manganese 0.4 per cent, the best results are obtained. If he got above or below that percentage of manganese there was a tendency to chill and a very definite tendency if he got above 0.4 per cent.

Nickel Will Not Make a Bad Iron Good

Dr. Everest, replying to the discussion on his paper, said we do not know very much about the influence of nickel in irons which are predominantly ferric but, if the combined carbon in an iron is such that the structure is pearlitic, then nickel can be used to advantage. There are cases in which the silicon is as high as 3 per cent in engineering castings and anything up to 2 per cent of nickel could be added effectively. He said he did not wish to put nickel forward as a cure-all. It will improve a good iron but it will not render a bad iron good.

With regard to wear tests, mentioned by Mr. MacPherran, the paper mentioned accelerated tests because in the laboratory there are no means by which the conditions of wear inside a cylinder, say of an automobile engine, can be reproduced. It is impossible to reproduce the conditions of lubrication, the correct bearing pressure, speed, oscillations, etc., and in the wear of cast iron the general experience is that any change in one of these conditions will totally alter the results. He believed that in certain cases nickel is effective in eliminating porosity but he would not recommend it for that specific purpose. The true benefit from nickel is the reduction of silicon. A great many claims are made for nickel based on the fact that the silicon is reduced and the nickel gives the necessary machinability.

In reply to Mr. Harrington, he said that the experiments had been carried out on piston valve liners for locomotive work and nickel had proved effective in eliminating porosity. In this country the average casting for that purpose would be centrifugally cast and the question of porosity would not then arise.

Mr. Harrington said he was glad Dr. Everest had pointed out that fundamentally the reason for improvement with the use of nickel was in the reduction of silicon but his own observations suggested that something more than that happened. There must be a change in the elements other than the silicon and he agreed that nickel could not be regarded as a cure-all. Dr. Everest said he did not agree with Mr. Harrington that there must be a change in the other elements than silicon and he knew of cases in which porosity had been entirely removed by the addition of nickel although he did not recommend nickel for the specific purpose of eliminating porosity.

Reviews of other papers and discussions will be published from time to time in later issues.

An account of the exhibition will also follow later.

United States Civil Service Commission announces an open competitive examination for a technical editor, at $3,500 a year, to fill a vacancy in the Bureau of Mines, Washington. Applications must be on file with the Commission at Washington not later than July 31. Full information may be obtained from the Commission, or from the Board of Examiners at the post office or customhouse in any city.

Industrial Activity Passing Peak

May Was High Month and Reaction Now Due—Supply of Commodities Exceeds Normal Demand

BY DR. LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

Favorable Factors

1. *Sustained employment and payrolls.*
2. *Improvement in retail trade.*
3. *High railroad freight traffic and earnings.*
4. *Large earnings and dividends by industrial corporations.*
5. *Machine tool orders at new high, considering the season.*
6. *Gold imports; strong Reserve Bank position.*
7. *Recovery in wheat prices; farm relief bill passed.*
8. *Absence of commodity price inflation.*
9. *Light mercantile inventories.*
10. *Strong financial position of most leading companies.*
11. *Reparations settlement; Mexican concord.*

Unfavorable Factors

1. ***Member banks over-loaned; brokers' loans excessive; crisis money rates; bonds decline.***
2. ***P-V line falls below normal, indicating supply in excess of demand.***
3. ***Declining building activity affects cement, brick, lumber, plumbing fixtures, etc.***
4. ***Declining exports, and unfavorable trade balance.***
5. ***Reduced farm purchasing power, with agricultural prices considerably under a year ago.***
6. ***Declining bank clearings.***
7. ***Declining net demand deposits.***
8. ***Automobile production lower, sales spotty, dealer inventories increased.***
9. ***Total industrial production at peak levels.***
10. ***Less favorable statistical position of oil, textile and copper industries.***
11. ***Tariff uncertainties.***

CHIEF among the business barometer changes which have occurred during the past month are: Building activity resumed its declining trend, after a temporary April spurt; recession in this field is now generally recognized, and its effects are apparent in several important building materials. Employment and payrolls, though well sustained, show a tendency to round off; this is notably true of the index compiled by the National Metal Trades Association. There was a rather pronounced decline in net demand deposits at the reporting member banks, which often occurs near the peak of a period of business expansion. Overproduction of textiles and oil developed again, or became worse, and stocks of copper showed a considerable increase. The bond market resumed its gradually declining trend.

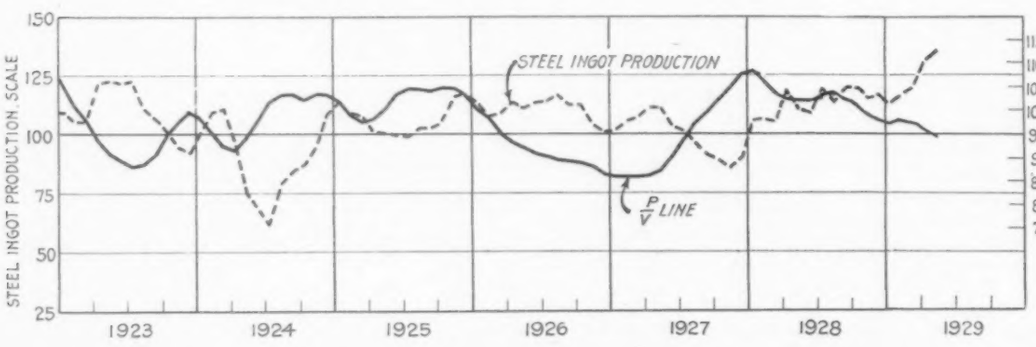
These changes are on the debit side.

Among the credits we find, first, an improvement in retail trade during May, accompanying better weather conditions. Grain prices recovered from the extreme low point to which they had fallen, and the passage of the farm relief bill without the radical debenture plan promises some ultimate good. At least, it removes a threat of harm. Commodity prices in general have become more stable. The settlement of the reparations question and the establishment of peace between the Mexican State and church are helpful long-range factors.

In other respects, the balance sheet remains unchanged. It is still true that business is very active and that the anticipated let-down is not yet definitely in sight. Perhaps the continued decline in bank clearings indicates the beginning of a slackening in trade. The automobile business, which has been so important, appears to be rounding off further. We note below some decrease in the volume of finished steel sales. But total industrial production and railroad car loadings continue at record levels.

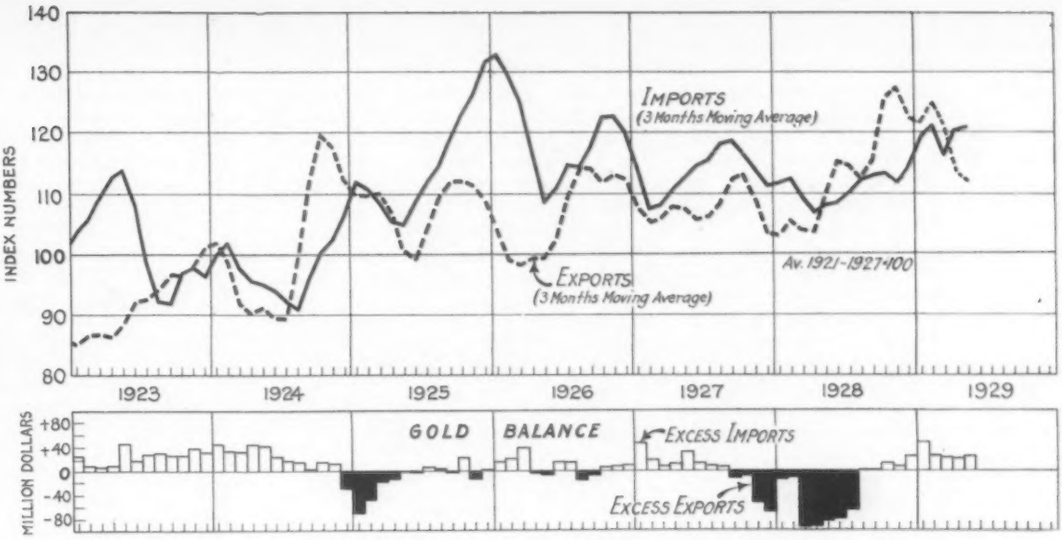
Barometers Indicate Approaching Decline

WE may conclude that business in May made a new peak, but that the gain was smaller than in preceding months, and that indications of the approach of some reaction became somewhat more evident. Among these indications, we would note the following: A very high ratio of bank loans to deposits, declining net de-

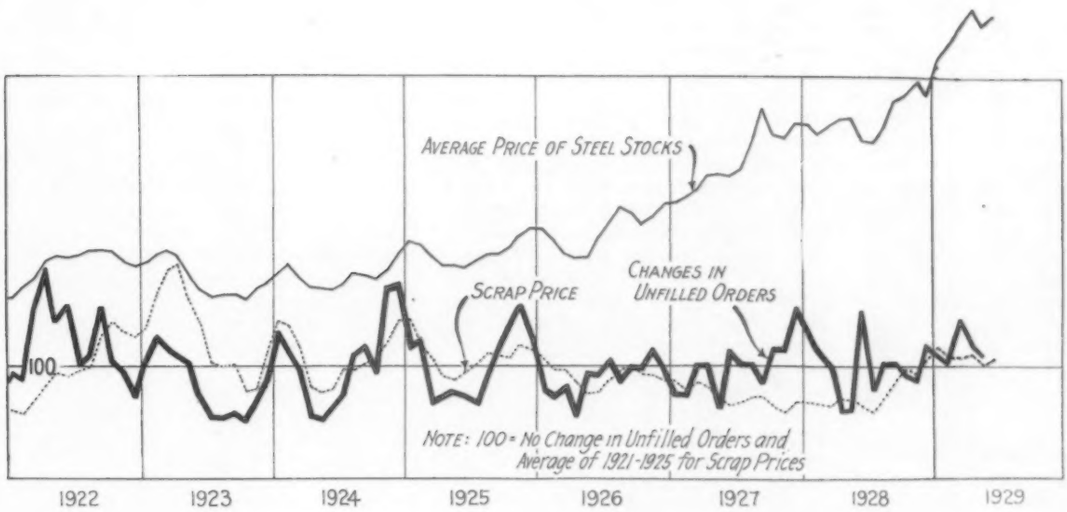


Downward Movement of P-V Line Has Now Carried It Below Normal. Steel production cannot much longer maintain its tremendous pace

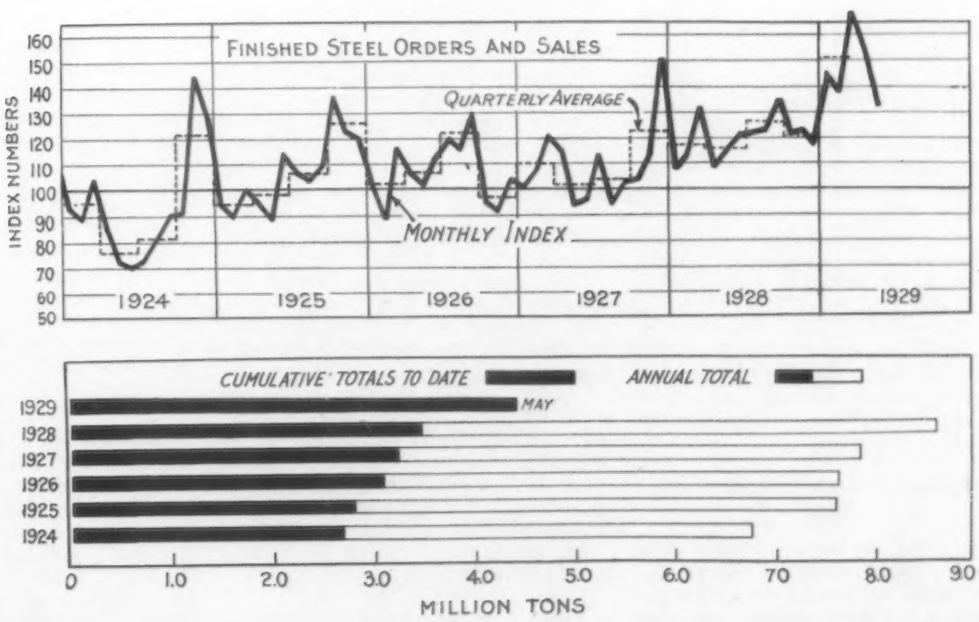
Imports, Which Are Regarded as a Good Index of Domestic Industrial Activity, Were Higher Than Exports in May, for the First Time in More Than Three Years. Gold movements are slight and contradictory



Unfilled Orders, While Still Upward, Showed a Smaller Gain. Stock prices have perhaps passed their high points and scrap prices, higher than for several years, are holding well above normal



Buying of Finished Steel Was Much Lower in May, But Higher Than for Any Previous May. The cumulative total is far ahead of any other year



mand deposits, crisis levels for money rates with the yields on stocks and bonds relatively low, high imports with declining exports, iron and steel production at abnormally high levels after a long period of rise, steel prices high in comparison with the general level (with the latter declining), and the fall of the P-V line below its normal level.

From the point of view of the business forecaster, each item in this list may be considered as more or less unfavorable in its bearing on the future trend of industry. To be sure, business forecasting is not sufficiently scientific to enable us to draw exact conclusions. To a considerable extent, we must rely upon analogy when we try to "catch the turns."

At present, however, analogies with conditions at the peaks of past business cycles are so strong that it is hard to escape the conclusion, either (1) that the course of business cycles has been changed or (2) that business activity is now near a peak. (We find such phenomena as the late run-up in copper prices followed by recession, the decline in wheat prices, the prevalence of mergers and large flotations of new stocks—all of which are often symptomatic of the approaching termination of a boom period.) It seems therefore that we should lean toward the latter conclusion, though we must recognize that definite forecasts as to the timing of business turns is highly uncertain, and the absence of inflation in business, together with the strong financial position of the Reserve Banks and our great industrial corporations, constitutes a sustaining factor.

Commodity Supply Above Demand

The P-V line (a ratio of commodity prices to the physical volume of trade) has now crossed normal on the decline. This we take to indicate that the general supply of commodities is distinctly above normal in comparison with the strength of the demand for such commodities. In the past, this development has usually indicated the approximate peak of the business cycle. In 1923, under similar circumstances, steel production (adjusted) held at the peak level for three months longer, or through July. In 1926 it held up for four months after the P-V line fell below normal, or through August.

Now it looks as though similar developments may be expected. After increasing in May, the ingot output has probably fallen off less than usual for the season in June and there is no reason to expect any large decrease in July. Present indications, however, suggest that production will decline more than seasonally by August at the latest.

Imports Exceed Exports in May

DECLINE in exports during May was listed above as one of the unfavorable factors. Considering the season, a recession in our total exports of merchandise has now been apparent for three months in succession. The same may be said of iron and steel exports. This is notable as fulfilling the predictions of economists that our high money rates, by curtailing foreign bond issues, would result in the decline in foreign trade.

Moreover, May imports increased, again considering the season, and were actually the largest for the month since 1920. This, of course, resulted in a so-called unfavorable balance of trade, which is the first monthly excess of imports over exports since April, 1926. It is the first time an unfavorable balance has occurred in May since 1923.

Finished Steel Sales Drop Sharply

PERHAPS it is significant that May sales of finished steel showed a relatively large decrease for a single month. While the decline may be partly attributed to a natural reaction from the record peak attained in March, the combined drop during April and May is the sharpest for the period since 1923, and the total sales for the second quarter are likely to be found further below the first quarter than in any year since 1924.

Sales of sheets and steel castings show declines considerably greater than usual for the season. Plates and structural steel sales made good increases, though not phenomenal ones. The total sales for May were the highest found in that month of any year on record. It seems fair to say, however, that a declining trend existed and that this is the more significant as the sales of sheets and castings are the most barometric of the various items included.

Speculation Holds Up Steel Shares

MEANWHILE, the common stocks of representative steel companies have shown a good recovery from the May decline. At this writing, they range all the way from 15 points below their old high levels of the year up to some which are at new high levels. The average is but little below the year's peak. The strength in steel stocks, doubtless, reflects large earnings which must be accruing from the active operations of the industry, together with a fairly satisfactory level of prices. As long as the renewed speculative interest is maintained, there is no reason to expect anything but strength in stocks.

Of course, no mechanical barometer is certain. Our rate-of-change index of unfilled steel orders, which often has been a good barometer of steel stocks, points downward. But it is still above the base line, which means that our adjusted index of unfilled orders is actually increasing. Steel scrap prices have recovered slightly thus far in June, though the movement continues to be one that may be called irregular and sidewise.

Taken together, the two barometers present no very clear picture. About all we can say is that they do not indicate a rise in steel stocks. Perhaps the conclusion may be that if the advances now talked of in speculative circles do occur, they will be based on speculative enthusiasm rather than on any new improvement in the steel outlook.

Iron and Steel Shipments to Be Heavy in Third Quarter

WASHINGTON, July 2.—Shipments of iron and steel products during the third quarter of the current year are estimated by Shippers' Regional Advisory Boards of the American Railway Association to amount to 519,419 cars, an increase of 10.3 per cent over the 470,873 cars shipped during July, August and September of last year. Estimates for machinery and boilers are 63,375 cars for the present quarter, an increase of 7.2 per cent over the 59,095 cars shipped during the corresponding quarter of 1928. Coal and coke shipments are expected to be 2,852,553 cars, or an increase of 14.6 per cent over 2,488,545 cars shipped during the third quarter of last year. The estimate for ore and concentrates is 914,863 cars, a gain of 7.7 per cent over the 849,732 cars shipped during the same quarter in 1928. For the 29 principal commodities dealt with, it is estimated that shipments in the current quarter will be approximately 9,816,948 cars, an increase of 632,287 cars, or 6.9 per cent, over the corresponding quarter of last year. The only regional boards of the 13 which estimated a decrease are the Southwest and Pacific Northwest, both of which expect only a small reduction.

Migration of Industry from City to Country

Among the trends noted by the National Bureau of Economic Research in its survey for the Committee on Recent Economic Changes is the shift of industry from city to country. Between 1918 and 1925, it is reported, the 25 largest cities in the country lost 326,800 wage earners, about 12 per cent of the average number employed. Cities between 100,000 and 250,000 population are said to have shown an even heavier loss, while during the same period the rural area is said to have gained 55,204. Increased manufacturing activity in rural areas is reported shown in the East North Central, South Atlantic, and Pacific divisions.

The National Association of Power Engineers will hold its forty-seventh annual convention and power show in Chattanooga, Tenn., Sept. 9 to 13. This will be in conjunction with the National Exhibitors' Association. Eugene H. Schimpf of J. H. Allison & Co., Chattanooga, is chairman of the executive committee.

New Rates Will Increase Competition

Mileage Scale Expected to Alter Situation Between Various Steel Producing Districts—Whole Effect Still in Doubt

BY L. W. MOFFETT

WASHINGTON, July 2.—The whole effect on competitive conditions in the iron and steel industry from the decision of the Interstate Commerce Commission setting up an entirely new scale of rates on manufactured products throughout Official Classification territory can be definitely known only after the new rates become effective on Oct. 20, in the opinion of traffic experts here who have followed the proceeding.

There is a consensus of view that the new scale will bring about greater uniformity, and that as a result there will be sharper competition in markets equidistant between producing centers and at points to which rates have been increased from one producing center and decreased from another.

Representative of the situation as it applies to so-called equidistant markets between Chicago and Pittsburgh are consuming destinations in Ohio. Under the existing rates the advantage for the most part rests with Chicago mills, but under the new scale it will swing in some instances to Pittsburgh mills while giving the latter a parity which does not now prevail, or more nearly approach a level with the Chicago district.

The present Chicago-Toledo rate is 26c., and it will be reduced 2c. to 24c., while the present Pittsburgh-Toledo rate is 26.5c. and it will be decreased by 3.5c. to 23.5c., thus changing the advantage to Pittsburgh by 0.5c. as against its present disadvantage of 0.5c. The Chicago-Cincinnati rate will remain at 27c., while the Pittsburgh-Cincinnati rate will be reduced from 28c. to 26c., a cut of 2c., so that the 1c. higher rate from Pittsburgh now prevailing will be changed to an advantage of 1c. To Deshler, Ohio, the rate from Chicago will be reduced 1.5c. from 26c. to 24.5c., while the rate from Pittsburgh will be reduced 3.5c. from 26c. to 22.5c., again turning a disadvantage for Pittsburgh into an advantage.

Because fifth-class rates generally, though not entirely, existent as to iron and steel products in Official Classification territory apply from East St. Louis to many important Indiana markets, while Chicago rates to these Indiana points are based on the Jones & Laughlin scale, but actually carrying rates below the scale, the new scale will narrow the spread to these points by 3.5c. to 7c. for 100 lb. in favor of East St. Louis. This is brought about by the fact that the scale to these Indiana points will mean reduced rates from East St. Louis and increased rates from Chicago. Illustrative of the changed condition that will result is the fact that the East St. Louis-Vincennes rate now is 23c., or 1c. higher than the Chicago-Vincennes rate of 22c., but under the new scale the rate from East St. Louis will be lowered by 4c. to 19c., while the rate from Chicago will be increased by 1.5c. to 23.5c., thus removing the present disadvantage of 1c. against East St. Louis and turning it into an advantage of 4.5c.

Effect of Long-Haul Reductions

The new scale manifestly reduces rates on long hauls, for the most part, and while the vast bulk of iron and steel shipments does not move in excess of 300 miles, there was much striving on the part of Middle Western mills especially to get lower rates on hauls beyond this distance. A striking example of the change the new scale will bring about for long hauls, and it is typical of a rather general situation, concerns rates from Pittsburgh and Buffalo to Lynchburg, Va. At present the rate from Pittsburgh and Buffalo is the same, 38c. Under the new scale the rate from Pittsburgh will be reduced 6c. to 32c., while the rate from Buffalo will be unchanged. In this instance, the so-called long haul of 418 miles from Pittsburgh will take a lower rate, while the still longer haul of 597 miles from Buffalo will take the same rate. This emphasizes the fact that to say long-haul rates will be reduced is a generality, with notable exceptions, and at the same time it gives force to the view that greater uniformity, on a mileage basis, will be established.

Application of the fifth-class rates from Pittsburgh to important markets in the East and of commodity rates lower than fifth class from the Eastern steel producing points to these markets was the source of complaint by Pittsburgh manufacturers, and on the whole the latter will benefit by the new scale while Eastern mills will be in a less strong position as to those markets, yet this will not be uniformly true. For example, the rate of 22.5c. from Bethlehem, Pa., to Albany, N. Y., will be reduced 1c. to 21.5c., while the Pittsburgh-Albany rate will remain at 34c., thus increasing the advantage to Bethlehem. Breaking up of the New England blanket rate will work to the advantage of mills in eastern Pennsylvania and surrounding sections nearest to New England markets, while working to the disadvantage of

Steel Rates Effective Oct. 20 Compared with Present Rates

(In Cents per 100 Lb.)

	From Pittsburgh			From Johnstown, Pa.			From Buffalo		
To	New Rates	Present Rates	Change —Decrease +Increase	New Rates	Present Rates	Change —Decrease +Increase	New Rates	Present Rates	Change —Decrease +Increase
New York	33	34	—1	29	32.5	—3.5	31	32	—1
Trenton, N. J.	30	34	—4	26.5	32.5	—6	31	32	—1
Philadelphia	29	32	—3	25.5	30.5	—5	31	32	—1
Berwick, Pa.	25	32	—7	21.5	30.5	—9	25.5	28	—2.5
Lancaster, Pa.	26	32	—6	22	30.5	—7.5	29	32	—3
Wilmington, Del.	29	32	—3	25.5	30.5	—5	32	32	None
Baltimore	27	31	—4	24.5	29.5	—5	31	32	—1
Syracuse, N. Y.	30	28.5	+1.5	27	28.5	—1.5	19	17.5	+1.5
Elmira, N. Y.	25.5	28.5	—3	22	28.5	—6.5	19	17.5	+1.5
Oswego, N. Y.	30	28.5	+1.5	28	28.5	— .5	19	21.5	—2.5
Utica, N. Y.	32	31.5	+ .5	29	30.5	—1.5	21.5	21.5	None
Albany, N. Y.	34	34	....	31	32.5	—1.5	26.5	21.5	+5
Norfolk, Va.	36	38	—2	34	36.5	—2.5	39	38	+1
Lynchburg, Va.	32	38	—6	30	36.5	—6.5	38	38	None

New Rates from Pittsburgh, Buffalo and Bethlehem to Points in Central and Eastern Districts

From Pittsburgh to	New Rates	Present Rates	Change —Decrease +Increase
New Kensington, Pa.	8	7.5	+ .5
Brackenbridge, Pa.	9	7.5	+1.5
Donora, Pa.	9.5	7	+2.5
Butler, Pa.	10	7.5	+2.5
Oil City, Pa.	17.5	15.5	+2.5
Erie, Pa.	19	22	+3
Parkersburg, W. Va.	19.5	19.5	None
From Johnstown, Pa., to			
Butler, Pa.	15	11	+4
Cumberland, Md.	15	13	+2
Du Bois, Pa.	16	18.5	—2.5
Wheeling, W. Va.	18.5	17.5	+1
From Buffalo to			
Erie, Pa.	15	13.5	+1.5
Warren, Pa.	15	15.5	— .5
North Tonawanda, N. Y.	7	5	+2
From Bethlehem, Pa., to			
Lancaster, Pa.	9.5	9	+ .5
Pottstown, Pa.	12	14.5	—2.5
Harrisburg, Pa.	15.5	17.5	—2
Baltimore	19.5	19	+ .5
Elmira, N. Y.	21.5	22.5	—1
Syracuse, N. Y.	23.5	22.5	+1
Utica, N. Y.	24	22.5	+1.5
Norfolk, Va.	27	28.5	—1.5
York, Pa.	16	19	—3
Scranton, Pa.	16	13	+3

those farther removed. This situation will apparently have considerable effect on the so-called Philadelphia group, which the commission said was too wide.

Short-haul rates are sharply increased under the decision. But it is doubted that where the hauls are comparatively a few miles distant, as, for instance from Pittsburgh to nearby consuming centers, the competitive conditions will change. The mills being so close to the market, it is contended that producing plants at greater distances will be unable to break into such markets. On the other hand, it is maintained that the new and higher scale for these short hauls will mean more revenue for the carriers and this is one reason for the assertion of some traffic experts that the new scale will mean more revenue for the carriers, rather than less, as predicted by Commissioner Woodlock.

Scale May Wipe Out Cross Hauling

There are those who have said that broadly the tendency of the decision will be to further "localize" the steel industry, but this statement also is held to be subject to modification on the ground that where long haul rates are reduced the tendency will be to centralize and that the exact situation will not be known until after the new scale has been under operation long enough to give it a test. Those holding the latter view contend that abolition of the Pittsburgh basing system has not "localized" industry so much as many had predicted. At the same time they are inclined to think that the new scale will have a tendency to wipe out cross hauling to an important extent.

A feature of the decision that is of considerable importance is the fact that the commission declined to comply with suggestions of many shippers and of central carriers that minimum as well as maximum rates should be established. The commission pointed out that it had exercised its power to prescribe minimum rates rarely and only under special circumstances.

The railroads thus are given leeway, within reasonable bounds, to establish rates lower than those prescribed in the basic scale, but it is doubted whether they will avail themselves of this privilege to any extent, first, because to do so might rob them of some revenue, and, second, the granting of special rates in one district would only invite requests from shippers in other districts for similar concessions, and thus start all over again the circle of preferential rates.

The commission's paragraph is very specific on this point, and some traffic experts point to it as the most vital statement in the decision. The commission said:

"The prescription of an inflexible scale would result in a rigidity in the rate structure which is both undesirable and unnecessary. Nevertheless, it is clearly to the advantage of both carriers and shippers generally that a uniform system of rates once established should not be constantly threatened by the granting of concessions from the scale in favor of certain localities or particular traffic. And it is obvious that, if the rate structure herein prescribed is to fulfill one of its primary purposes, that of removing and preventing undue prejudice and preference, departures therefrom should be made only when there is important necessity therefor, and only when such departures can be fully justified under section 3 of the act." (Sec. 3 forbids giving undue preference or advantage to a locality, etc., and likewise makes it unlawful to subject a locality to undue prejudice or disadvantage).

Comparison of New Rates From East St. Louis and Chicago to Points in Indiana

	From East St. Louis			From Chicago		
To*	New Rates	Present Rates	Change —Decrease +Increase	New Rates	Present Rates	Change —Decrease +Increase
Vincennes	19	23	—4	23.5	22	+1.5
Evansville	20	23.5	—3.5	26	23.5	+3.5
Lafayette	23.5	26.5	—3	17.5	15	+2.5
Indianapolis	23.5	27	—4.5	21	18	+3
Frankfort	24	27	—3	18.5	16.5	+2
Kokomo	25	27.5	—2.5	18.5	16.5	+2
Anderson	25.5	27.5	—2	20	18	+2
Muncie	26.5	28.5	—2	20.5	18	+1.5
Richmond	27	29	—2	22.5	20	+2.5
South Bend	27	30	—3	15	12.5	+1.5
Fort Wayne	28	30.5	—2.5	19	16.5	+2.5

*Fifth class rates apply generally from East St. Louis to these Indiana points, while from the Chicago district group rates based on the Jones & Laughlin scale apply, but those established are actually under that scale. It will be seen that under the new scale, if literally followed, the spreads between East St. Louis and Chicago to these Indiana points will be narrowed from 3.5c. to 7c. per 100 lb.

—

Greater Use of Trucks and Water Forecast in Chicago

CHICAGO, July 1.—Chicago producers, in making an analysis of the decision of the Interstate Commerce Commission to establish mileage rates on iron and steel, find that the scale which is to become effective Oct. 20, will decrease rates from Eastern centers of production into the Illinois-Indiana territory and will increase rates on short hauls that fall within the district that local shippers claim is their natural territory and in which, they say, over 50 per cent of their iron and steel tonnage moves.

It is anticipated that the higher short haul rates may force the use of trucks and water where possible, thereby affecting the revenue of the carriers. It is computed by some that trucks will be used on hauls from Chicago to such points as Milwaukee, with savings of more than 50 per cent, as compared with the new mileage scale. The buyer will have the additional advantage that he will get more prompt service and save the cost of haulage from freight house or steam track.

Points of importance, as viewed by local shippers, are: That groups of origin, including switching territory are permitted when not exceeding 20 miles in width, but no destination groups are authorized. The decision permits groups of origin which are left to the carriers to establish.

An analysis reveals that the decision raises many short hauls ½c. over the mileage scale that was proposed late last year. The long haul rates are virtually unchanged. Twenty-three out of 31 rates are raised to that number of points of destination within a radius of 285 miles of Chicago. St. Louis, which is 279 miles from Chicago and 612 miles from Pittsburgh, will have rates lowered from Pittsburgh and raised

from Chicago. The present rate from Chicago to St. Louis is 22c., and this will be raised to 25.5c. by the decision. The old rate from Pittsburgh was 40.5c., while the new rate will be 39c. on a point to point basis, or, as computed by some, 37c. if a group is permitted.

—

Pittsburgh Mills Look Upon Rate Decision Favorably

PITTSBURGH, July 1.—Although Pittsburgh district steel companies are generally inclined to view with favor the recent decision of the Interstate Commerce Commission prescribing a basic mileage scale of freight rates on iron and steel products in Official Classification Territory, a number of points remain to be settled before its effect on shippers in this territory can be fully measured. Insofar as the decision places Pittsburgh on the same basis as other steel producing centers with regard to freight rates, it is regarded as a victory by shippers in this territory. For the decision recognizes the principle of a definite mileage basis for freight rates which has long been urged by Pittsburgh companies and abolishes the so-called discrimination against producers in this district which they have sought to correct.

Several points in the decision remain to be settled, some of them of particular interest to Pittsburgh district shippers. The Pittsburgh origin group is criticized, but no definite remedy is suggested. It is the understanding here that the carriers must decide what disposition is to be made, and their action will be watched with interest. If the various steel producing points are placed on a strict mileage basis, companies located to the east and west of Pittsburgh will be penalized in their rates in one direction, while in the other direction they will enjoy lower rates than Pittsburgh.

Some Uncertainty as to Effects

Settlement of the shortest routes over which traffic can move will also prove important to shippers, as rather marked changes in mileages are expected to result. These mileages are now being computed and, until this work has been completed, traffic departments are not certain just how the new schedules will affect them.

The more or less general increase in short haul rates will not influence Pittsburgh companies particularly, as none of the old relationships will be disturbed. Also the rates prescribed are maximum rates and the carriers will not likely make them effective where possible loss of business might result or well defined movements be interrupted.

Changes in the rates from Pittsburgh to more distant competitive points were generally covered in THE IRON AGE last week. Lower rates to Atlantic seaboard points, notably Baltimore and Philadelphia, will be of particular benefit to Pittsburgh, while the lower Pittsburgh-St. Louis rate, coupled with a higher Chicago-St. Louis tariff, places Pittsburgh in a much better position to compete with Chicago in the St. Louis territory. The action of the commission is raising the carload minimum from 36,000 lb. to 40,000 lb. is also generally favored in this district.

—

Cleveland Mills to Gain Some Advantages

CLEVELAND, July 1.—The proposed changes in iron and steel freight rates will result in some advantage to Cleveland mills. These mills will be slightly benefited because of a greater reduction in the rate from Cleveland to Detroit than from other producing points to Detroit. Cleveland mills will also be benefited in the local market by the increase in rates from Youngstown to Cleveland. On the other hand, Youngstown mills will suffer as far as Cleveland market is concerned.

Rates to Detroit are reduced 3.50c. a 100 lb. from Cleveland, while the reduction to Detroit is 2.50c. from Pittsburgh, 3c. from Youngstown and 2c. from Chicago. Consequently Cleveland mills will have a net reduction of 10c. a ton in the Detroit rate, as compared with Youngstown, and 20c., as compared with Pittsburgh. The present rate from Pittsburgh to Cleveland is 19c. and from Youngstown to Cleveland 9.5c. This spread will be reduced materially by the decrease of the Pittsburgh rate to 18.50c. and by a 3.50c. increase of the Youngstown rate to 13c.

Valley Mills Must Absorb Higher Rates

As Cleveland is used as the basing point for steel bars, this advance will mean that Valley mills will be compelled to absorb a higher freight rate to sell their bar mill products in Cleveland. In addition, in selling sheets and other products that carry a Pittsburgh base, the Youngstown mills will be in a less advantageous position than heretofore, as compared with Pittsburgh, in selling steel in Cleveland. Cleveland mills claim to suffer from a relative disadvantage as compared with Pittsburgh and Youngstown in the Indiana, Illinois and western Ohio districts. This disadvantage will be eliminated in the new rates.

Present and Mileage Carload Rates on Iron and Steel in Cents per 100 lb. to Western Consuming Points

To	From Chicago		From Pittsburgh	
	Present	New	Present	New
Decatur, Ill.	18	20	36	36
Jacksonville, Ill.	20	22½	40½	38
LaSalle, Ill.	13	16	38½	37
Moline, Ill.	17	20	43	39
Peoria, Ill.	16½	19½	36	37
Quincy, Ill.	20	25	43	41
Rockford, Ill.	12	15	38½	37
Springfield, Ill.	18	21	38	37
Evansville, Ind.	23½	26	37	36
Fort Wayne, Ind.	16½	19	26	27
Indianapolis	18	21	29	30
Kokomo, Ind.	16½	18½	29	30
Michigan City, Ind.	8	11½	31	33
South Bend, Ind.	12½	15	30	31
Terre Haute, Ind.	18	20½	34	34
Vincennes, Ind.	22	23½	35	35
Detroit	27½	25½	29	27
Grand Rapids, Mich.	25½	21	33	32
Holland, Mich.	23½	19½	34½	34
Muskegon, Mich.	26	21½	35	34
Saginaw, Mich.	29½	26½	32½	31
Clinton, Iowa	17	18½	43	39
Dubuque, Iowa	17	20½	43	40
Keokuk, Iowa	20	24	43	41
St. Louis	22	25½	40½	39
Cincinnati	28	26	27	27
Hamilton, Ohio	27½	25	27	26
Toledo, Ohio	26½	23½	26	23½
Beloit, Wis.	12	15½	44	37½
Madison, Wis.	14	18	46	38
Milwaukee	9½	14½	37	37

Owing to the great number of nonmembers of the Institute of Metals (British) who are anxious to take part in the Düsseldorf meeting of the institute, to be held Sept. 9 to 12, the council of the institute will meet specially on July 4 to consider applications for membership. Only members of the institute will be able to take part in the various functions in connection with the Düsseldorf conference, which will be very largely attended and is expected to be a great success. The institute is visiting Germany at the invitation of the Verein Deutscher Ingenieure and the Deutsche Gessellschaft für Metallkunde.

Comparison of New Rates From Pittsburgh and Chicago to Points in Ohio

To*	From Pittsburgh			From Chicago		
	New Rates	Present Rates	Change —Decrease +Increase	New Rates	Present Rates	Change —Decrease +Increase
Toledo	24	26	—2	23.5	26.5	—3.5
Forest	23	26	—3	23.5	26.5	—3.5
Dayton	25	26	—1	25	27.5	—2.5
Hageman	26	27	—1	26	28	—2
Deshler	24.5	26	—1.5	22.5	26	—3.5
Lima	25	26	—1	22	26	—4
Hamilton	26.5	27	— .5	25	27.5	—2.5
Cincinnati	27	27	None	26	28	—2

*Points approximately equidistant from Chicago and Pittsburgh.

Tariff Views Are in Conflict

Widely Varying Testimony at Washington Hearings, Particularly on Manganese Ore—Pig Iron Producers Ask for $3 Duty

BY L. W. MOFFETT

WASHINGTON, July 2.—Hearings on the iron and steel schedule of the tariff before a subcommittee of the Senate Committee on Finance originally carried a list of approximately 120 witnesses, the largest for any of the schedules, and while the number is being pared down somewhat through the practice of having one or two present the common views of a greater number, it is improbable that the hearings will be completed before the end of next week.

This is due to the program announced by Senator Reed of Pennsylvania, chairman of the subcommittee, who explained that the hearings would not be continuous. They were begun on Wednesday of last week, ran through Friday, and were resumed yesterday, when they were postponed until next Monday, in the hope that they would be ended before the following Saturday. No hearings will be held on the latter day. There are about 75 witnesses still listed.

Testimony regarding schedules on raw materials, semi-finished and finished rolled products, however, has been practically completed. The iron and steel industry, which, for the first time, spoke through a single organization, the American Iron and Steel Institute, at the hearings before the Ways and Means Committee of the House, continued that practice before the Senate subcommittee. Had this not been done the length of the hearings would have been appreciably extended.

The steel industry's general position was explained by John A. Topping, vice-president of the institute, and chairman of the Republic Iron & Steel Co. Suggestions for specific changes in rates, phraseology, etc., were laid before the subcommittee by the institute's tariff representative, Thomas J. Doherty, while its request for removal of the duty on manganese ore was made by L. E. Block, chairman, Inland Steel Co., Chicago, and Dr. C. K. Leith, University of Wisconsin, Madison, Wis. The statements of Mr. Topping and Mr. Doherty were published in THE IRON AGE of June 27, page 1775.

The members of the subcommittee consist of three Republicans, Senator Reed, Senator Edge, New Jersey, and Senator Smoot of Utah, chairman of the Finance Committee, and two Democrats, Senator King of Utah and Senator Barkley of Kentucky. The three members who have consistently sat at the hearings, and manifested deep interest in the proceedings, as shown by the many questions asked and comments made, are Senator Reed, Senator Edge and Senator King. At brief periods Senator Barkley participated in the hearings. Senator Smoot, occupied with other hearings, has not attended the hearings on the iron and steel schedule.

High Spots of Metal Tariff Hearings

STEEL industry asks for free manganese ore. Domestic ore producers plead for higher duty to protect their industry.

Merchant pig iron producers urge increase in pig iron duty from $1.12½ to $3 a ton.

Uniform duty of ½c. a lb. on muck bars and bar iron valued at less than 2½c. a lb. requested.

Manufacturers of tool steel and other fine steels propose sliding scale of duties, based on values, with rates generally higher.

Forging Manufacturers' Association asks that duty of 6/10c. a lb. on axles and other forgings be increased to 2c. a lb.

Importers generally object to higher rates proposed in House bill, and in some instances want reductions instead. Particular objections voiced to alloys in steels, hollow drill steel, sheet steel piling and sponge iron.

House Bill Not Satisfactory

In a large measure the hearings are similar to those held before the House committee, though the Senate hearings show more intensity of views on both sides. It is evident that the House bill is not satisfactory to either side, except in a few instances.

Likewise, it is apparent that the Senate subcommittee is not satisfied with the House bill, and it may be expected that, if the majority views of the subcommittee prevail, the iron and steel schedule will be greatly changed. At the same time there is necessarily a division of opinion within the subcommittee, and this does not seem to be due entirely to its bi-partisan character. As to steel rates, it is conceivable, in the absence of specific evidence to the contrary, that the Republicans are in agreement and that their views were reflected when Senator Reed, in the course of questioning Mr. Topping, said that it may safely be assumed that rates on steel will not be decreased, though he did not indicate that they would be increased, as the institute asked, at least not to the extent requested.

Both Senator Reed and Senator Edge made it plain that they think the steel schedule requires considerable reclassification so that there will be more uniformity as to duties and paragraphs on products of similar or nearly similar values and of like stages of manufacture. An example of this position was expressed by both senators regarding such products as plates, shapes and bars, some of which are lumped with raw steel and semi-finished steel.

Favor Removing Manganese Ore Duty

Statements of Senator Reed and Senator Edge also indicated they are in agreement in favoring the removal of the duty on manganese ore and reduction of the duties on ferromanganese, tungsten ore, tungsten metal and tungsten scrap. It seems doubtful that this view is shared, at least wholly, by the other senators. Although their tariff views are about as far apart as the poles, it is believed that Senator Smoot and Senator King, the former a high protectionist, and the latter a low-tariff advocate, will oppose a reduction in the duty of 1c. a lb. on manganese ore, and it is the impression that Senator Barkley is in accord with Senator Smoot and Senator King. This apparently curious alinement may be attributed to the fact that Senators Smoot, King and Barkley represent States producing manganese ore, and there is a strong political sentiment back of the request of American producers of this ore for an increase in the duty, though an increase is held to be unlikely.

Senator Oddie, Republican, of Nevada, is the author of a proposed amendment increasing manganese ore duties, which is being earnestly supported by domestic producers and as strongly opposed by the iron and steel industry. There is also much political support from the West of the duties on tungsten ore and metal. The matter of a duty on ferroman-

LIBRARY
WEST VIRGINIA UNIVERSITY

ganese necessarily is related to that on manganese ore, and Senator Reed implied that if manganese ore were made free of duty that of 1⅞c. a lb. on ferromanganese should be reduced to ⅞c. a lb.

Senator Reed made this suggestion when John J. Howard of the Lavino Furnace Co. was on the stand, and went further when Nelson B. Franklin, Washington, mining expert, was before the subcommittee and asked to justify the duty of 50c. a lb. carried in the House bill on tungsten ore, an increase from the present duty of 45c. Senator Reed said that, though he is a high protectionist, he is inclined to reduce duties on tungsten ore, tungsten metal and tungsten scrap, the latter given a duty of 72c. a lb., tungsten content, as against the general steel scrap rate of 75c. a ton.

When Dr. J. A. Mathews of the Crucible Steel Co. of America was before the subcommittee, Senator Edge indicated some of his tariff views, after explaining, as Senator Reed did, that he, too, was a high protectionist.

"Industries Encouraged without Result"

"Raw materials, such as manganese, tungsten and others, were given duties to see if it were possible to encourage their commercial output," said Senator Edge. "We have had seven years to try out the experiment. It is now proper to ask whether it has been successful." In the case of manganese and tungsten, he added, they have not been produced in quantities to meet domestic needs.

"We have been encouraging these industries without any result," interjected Senator Reed. "Do you not think it time to end that experiment?"

Dr. Mathews said that he was not in favor of wiping out these duties. On the contrary, he felt that domestic industries producing these raw materials should be encouraged.

It was during the course of Mr. Doherty's testimony that Senator Reed expressed the view shared by Senator Edge, and perhaps other senators of the subcommittee, that the steel schedule should be subjected to considerable reclassification. Senator Reed told Mr. Doherty that he was very much impressed by the lack of symmetry in the paragraphs covering plates and shapes and previously he had commented on a similar condition as to other paragraphs. In commenting on the paragraphs covering plates and shapes, Senator Reed pointed out that they represent the same degree of manufacture and carry approximately the same prices, yet plates take higher duties and are imported in much smaller quantities than shapes.

"It would seem," said Senator Reed, "that either the duties on plates are too high or those on shapes are too low."

Mr. Doherty expressed the opinion that one important controlling factor was demand in the domestic market.

Domestic Manganese Ore Producers and Steel Makers at Odds

AS had been anticipated, the most vigorously contested item was manganese ore. The subcommittee showed an unusual interest in the subject, evidently being aware of the wide difference of views existing between the steel industry on the one hand and domestic manganese producers on the other. Steel manufacturers asked that the duty be removed entirely. Domestic manganese producers asked for an increase in the duty, the latter favoring the amendment proposed by Senator Oddie providing for a duty of ½c. a lb. of contained manganese of 10 per cent to 20 per cent metallic manganese; 1c. a lb. for 20 to 25 per cent manganese and 1½c. a lb. for 25 per cent and more manganese. The present duty is 1c. a lb. of contained manganese in excess of 30 per cent.

The lively interest manifested in the subject was indicated by the fact that 13 witnesses had been listed to appear, although through the consolidation of common views the list was reduced somewhat. Broadly, the contest was between the American Iron and Steel Institute, as representative of the domestic steel industry, and the American Manganese Producers' Association.

Speaking on behalf of the institute and the industry generally were L. E. Block, chairman, Inland Steel Co., Chicago, and Dr. C. R. Leith, University of Wisconsin, Madison, Wis., consulting geologist, who also spoke for Feodore E. Foss, Wheeling Steel Corporation, Wheeling, W. Va. Others who asked for removal of the manganese ore duty were R. T. Caldwell, American Rolling Mill Co., Ashland, Ky., and Percival Chrystie, Taylor-Wharton Iron & Steel Co., High Bridge, N. J. These witnesses also asked for a reduction in the duty on ferromanganese, the institute seeking a cut to 25 per cent ad valorem.

The position of domestic manganese ore producers was laid before the subcommittee by J. Carson Adkerson, president, American Manganese Producers' Association, Washington, and several others.

It was contended by the steel interests that there are no high grade manganese deposits of importance in the United States, that promises of the domestic producers to develop processes for the manufacture of high grade material from low grade ores on a commercial and reasonable price basis had not been fulfilled and give no indication of being fulfilled, and that the duty is an unnecessary burden on consumers.

In direct contrast, domestic manganese producers maintained that processes for the beneficiation of low grade ores for the production of standard ferromanganese on a commercial basis at reasonable prices are being developed, enormous deposits of material which can be treated for this purpose exist and have been discovered, and some plants now are making high grade ore, and if given further protection the domestic producers will be able to supply the domestic requirements satisfactorily.

Steel makers asked for the conservation of such supplies as exist in case of necessity in times of emergency. Manganese interests on the other hand asked for added protection in order to develop any industry which will be able to supply necessary requirements in times of emergency. Senator Oddie submitted a brief in support of his amendment.

Appearing for David Taylor & Co., importer, Denver, Colo., former United States Senator C. S. Thomas protested against the House bill increasing the duty on tungsten ore from 45c. to 50c. a lb. of tungsten content. He said that no duty that Congress might place on tungsten ore will increase domestic production. He also opposed the House action in reclassifying tungsten scrap, giving it a duty of 72c. a lb. of tungsten content in excess of 0.2 per cent. The committee, including both Senators Reed and Edge, also seemed to think the increase on tungsten ore and tungsten scrap was not justified and called Nelson Franklin, Washington, mining expert, to explain the reason. He said that the duty of 50c. on the metallic content of tungsten ore represented a specific duty of a little over $500 on the 47.5 per cent grade. The duty would work out at $532, due to the difference in costs in China and the United States.

"I am a high protectionist," said Senator Reed, "but my inclination is to reduce the duties on tungsten ore, tungsten metal and tungsten scrap."

"If you do," said Mr. Franklin, "the price will go out of sight." It apparently was the view of Mr. Franklin that domestic production would cease if duties were lowered, leaving the country dependent solely upon foreign material.

Importers Voice Protests

Fred Truempy, Truempy, Faesy & Besthoff, New York importers, protested against the separate classification of silicon aluminum, aluminum silicon, alsimin, ferrosilicon aluminum and ferroaluminum silicon, providing a duty of 5c. a lb., and said that these items should be included under the section providing a duty of 25 per cent on all alloys used in the manufacture of steel or iron. He was especially critical of the duty as it affects alsimin, which was given a

higher classification by a Treasury decision and then written into the house bill.

M. K. Tholand, Ekstrand & Tholand, New York importers, protested against sponge iron being classified with muck bars, and being given a duty of 3/10c. a lb. He said the old rate was 30 per cent, but that sponge iron ought to be classified with and given the same duty as pig iron. There is no commercial production in the United States, but he admitted steel companies of the United States are experimenting with sponge iron with a view to getting into production. His firm imports the product from Sweden.

Pig Iron Producers Ask for $3 a Ton Duty

MERCHANT blast furnace interests asked for a duty of $3 a ton on pig iron. A plea for this rate was made before the House Committee on Ways and Means, but the House bill provided for a duty of $1.12½, which has prevailed since March 25, 1927, when by presidential proclamation it was increased by 50 per cent under the flexible provision of the Fordney-McCumber law. Contention was made by merchant producers that this duty is not sufficient to meet competition from abroad, which was said to affect Eastern furnaces most vitally, but to reach back to furnaces in the Middle West.

Pig iron makers in the central and adjoining sections of the country were represented before the subcommittee by Colonel F. B. Richards of the Hanna Furnace Co., Cleveland, while Eastern seaboard manufacturers and others presented their case through John W. Logan, Alan Wood Steel Co., Conshohocken, Pa., who indorsed the request of Coloned Richards for a duty of $3.

Colonel Richards was questioned closely by Senator King, Democrat, of Utah, as to domestic production and imports, earnings, consolidations, etc., who sought to bring out the point that incoming shipments were extremely small when compared with domestic output. Making a distinction between iron in pigs, such as that produced by merchant furnaces, and pig iron, made by steelworks stacks for consumption in the molten state, Colonel Richards explained that the tariff deals with iron in pigs sold by merchant furnaces and in some instances a small part of the production of a few of the steel companies which is sold in the market.

Colonel Richards said that, of the total production of 37,401,638 tons last year, 25,924,323 tons was used by steelmakers in molten condition, while 3,753,649 tons was iron in pigs for makers' own use and was the accumulation of iron made by blast furnaces and was available in the open market. Importations, he said, were 441,425 tons in 1925; 445,773 tons in 1926; 132,568 tons in 1927 and 140,694 tons in 1928. Between 91 and 92 per cent of these importations, it was stated, were landed at Northeast Atlantic ports from Philadelphia to Boston and in this area, served by furnaces in New York, Pennsylvania and Massachusetts, there is an approximate melt, when the foundries are running, of about 2,000,000 tons of iron in pigs. This territory, it was said, is where foreign competition is most severe. Explanation was given of prices over a period of years and differences in costs of production in the United States and abroad, the latter, as shown by a report of the Tariff Commission averaging in 1924 $7.16 under domestic costs. The countervailing duty against iron from India and the anti-dumping order against German iron brought about reduction in importations in 1927 and 1928. Neither of these penalties now applies, and Colonel Richards told the subcommittee that domestic producers are now in the same position as in 1924, and, "with reparations settled, from now on we may expect the keenest competition from German iron."

Cannot Keep Out Indian Iron

"We cannot hope, with a $3 duty, to keep out the iron from India, as they have a surplus of about 250,000 tons, part of which is bound to come to the United States, but as their product is widely distributed we are hoping the amount sent to the United States will be only a reasonable percentage of this surplus," said Colonel Richards.

"We may also expect competition from the Dutch furnaces, which have been built within the past few years, and in a short time they will have four modern furnaces. There is very little fabrication in the manufacturing field in the Netherlands, and the production of the four furnaces will be shipped abroad. As we understand it, these furnaces were largely financed by the cities of Amsterdam and Rotterdam, which use the gas produced by the by-product ovens.

"At the present time there is a measure of prosperity, and we are getting more for our iron. There is a shortage of pig iron in England, so it is reported, as well as coke, and the Germans and Dutch are shipping large tonnages to Great Britain. So far as one of these countries is concerned, the $1.12½ duty provided in the House bill is approximately no protection at all, and we have every reason to believe that they will use every effort, with reparations settled, when necessary in the future to again invade New England, New York and Pennsylvania markets with 400,000 to 500,000 tons of pig iron a year, which they can easily do under the present tariff, and force our prices down again to a point where we have tremendous losses in the manufacture of our iron."

Colonel Richards said that internal competition will keep prices in this country for many years to come entirely within reasonable bounds and the purchasers of pig iron will not in any way suffer by reason of the tariff asked for.

Compares Costs Here and Abroad

India, Netherlands, and Germany were said to have efficient plants, many of the furnaces in Germany having a capacity of 800 tons of pig iron a day. To build a furnace of this capacity in the United States at this time, including by-product coke ovens and power plants to use the waste heat from the furnaces, would cost over $8,000,000, the subcommittee was told. Colonel Richards said that it has been stated by an engineer, who made the appraisal of the plants which formed the United Steel Co. in Germany, that they could be reproduced with 45 per cent of the capital required in the United States.

Figuring the capital charge at 5 per cent and depreciation at 7 per cent, the American blast furnace today, it was pointed out, would have to face, as a capital and depreciation charge, $960,000 a year, and this, on a production of 292,000 tons of pig iron, would be $3.28 a ton. Figuring the German outlay in the same way, taking the capital charge at 5 per cent and the depreciation charge at 7 per cent on the same tonnage, it was stated, would mean a cost of $1.48 per ton on this production. The labor, supplies and all costs at the American furnace were placed at $1.50 per ton and at the German furnace 76c. per ton. This would make the capital and depreciation charges and costs, without figuring any interest on any other overhead, and not including general insurance, $4.78 per ton for the American furnace and $2.24 per ton for the German furnace, which, it was pointed out, would give an advantage to the German built and operated furnace of $2.54 per ton on capital and depreciation charges and labor, Colonel Richards said, explaining that he was assuming that the cost of shipping iron to New York City from the German furnaces, including any rail, freight and ocean carrying charges, would be about 17 shillings, or about $4.25 and even less. The open quotations, f.o.b. vessel channel ports today, it was stated, are $15.76 and the transportation about 12 shillings, or roughly about $3, making an open quotation delivered New York $18.76, without duty.

"We are paying to the railroad companies double the freight on all materials to be assembled, as well as on the finished products going out, as against the freight of 1913," Colonel

Richards said. "We are paying from two and one-half to three times more for labor than is paid in European countries, while the wages in India, we understand, run from 14c. to 16c. a day. The freight from Buffalo to the metropolitan district of New York and New England is $4.91 a ton. Iron can be transported from Holland to Atlantic ports for only 16c. a ton more than the present rate from Philadelphia to Bridgeport, Conn., the respective rates being $3.81 and $3.65 per ton.

"In November a cargo of about 3700 tons of Indian iron was received in Philadelphia and the customs invoice was sworn to at $12.61 a ton. It costs about $5.03 a ton to bring this iron from Tata, India, through Calcutta and deliver it in New York harbor. Recent reports from India show that they have reduced their costs from $13.36 per ton, as found by the Federal Tariff Commission in 1924, to $9.76 per ton at Tata, India, and it is owing to this fact that we make the statement that a duty of $3 a ton will not keep out Indian iron."

Merchant Furnaces Losing Money

Colonel Richards submitted a consolidated statement showing net losses of 32 merchant furnaces extending from Chicago to east Atlantic ports, for 1926, 1927 and 1928, the figures being $1,085,818.39; $2,751,832.92 and $1,241,189.13 respectively. On the other hand, Colonel Richards said, the most recent earnings of the iron and steel industry show that on a capital of about $39,000,000,000, it earned 5.71; on average shares of common stock, $10.58 per share and on book value, 5.41 per cent. These figures were said to include losses in the statement relating to the merchant blast furnaces. The companies for which he appeared were the St. Louis Gas & Coke Corporation, Granite City, Ill.; Federal furnaces of By-Products Coke Corporation, Chicago; Zenith Furnace Co., Duluth, Minn.; Toledo Furnace Co., Toledo, Ohio; Adrian Furnace Co., DuBois, Pa.; Davison Coke & Iron Co., Shenango Furnace Co. and Reliance Coke & Furnace Co., Pittsburgh; Marting Iron & Steel Co., Ironton, Ohio, and the Hanna Furnace Co., Cleveland.

Testimony of a similar character was presented by Mr. Logan, who said that Eastern seaboard merchant furnaces were the hardest hit by imports. Pig iron, he said, needs and is entitled to a duty in line with that on its products, which were said to have protective duties as high or higher than those existing when pig iron had a duty of $2.50 a ton. Almost 80 per cent of the entire production of pig iron in the United States was said to be made by steel companies for their own use.

Mr. Logan appeared for the following producers: Mystic Iron Works, Boston; Witherbee, Sherman & Co., Port Henry, N. Y.; Hudson Valley Coke & Products Corporation, Troy, N. Y.; Chateaugay Ore & Iron Co., Lyon Mountain, N. Y.; E. & G. Brooke Iron Co.; Birdsboro, Pa.; Colonial Iron Co., Riddlesburg, Pa.; Delaware River Steel Co., Chester, Pa.; Reading Iron Co. and Thomas Iron Co., Reading, Pa.; Alan Wood Steel Co., Conshohocken, Pa.; Pulaski Iron Co., Pulaski, Va.; Roane Iron Co., Rockwood, Tenn.; Central Iron & Coal Co., Holt, Ala.; Sloss Sheffield Steel & Iron Co., Birmingham, Woodward Iron Co., Woodward, Ala.; Columbia Steel Corporation, Provo, Utah.

Asks Higher Duty on Bar Iron

A uniform duty of ½c. a lb. on muck bars and bar iron valued at less than 2½c. a lb. was asked for by Charles Hart, Wrought Iron Co. of America, Philadelphia. The House bill, which made no change in muck bar and bar iron duties, provides 2/10c. a lb. when the value is not over 1c.; 3/10c. a lb. when valued at 1c. and not over 1½c., and 5/10c. a lb. when valued above 1½c. and not above 2½c. Mr. Hart said that imports of bar iron come into the United States at less than the American prices and affect the domestic market adversely. He said bar iron producers are also affected by imports of steel bars. He approved of the action of the House in specifically naming sponge iron and placing it in the muck bar and bar iron paragraph. He said that sponge iron competes with muck bar and is made in Sweden.

Wants Lead Duties Raised

George E. Collins, Denver, appointed by a committee of the Colorado State Legislature, the first witness before the subcommittee, asked for an increase of 33 1/3 per cent in the present tariff rates on lead ores, lead products and metallic lead; for a duty of 1½c. a lb. on zinc ore, regardless of its metallic content, and for an increase of 50 per cent in the duty on tungsten ore.

Tool and Fine Steel Makers Suggest Sliding Scale

APPEARING on behalf of the tool and fine steel industry Dr. J. A. Mathews, Crucible Steel Co. of America, asked for a sliding scale of rates as the values increase. These products coming under paragraph 304, carry a flat rate of about 20 per cent, and Doctor Mathews said this rate does not take into consideration the fact that higher prices represent greater labor costs on a given unit of material. For that reason he asked that the duties progress upward with prices. The scale he proposed ranges from 20 per cent to 35 per cent on carbon steels valued at over 16c. a lb. The subcommittee was told that about 34,000 tons was imported in 1927 under paragraphs 304, 308, 313, 315 and 316, and that it was all material that would resell in the United States at 5c. a lb. or higher, thereby bringing it into the category of tool and fine steels.

Tonnage producers, he said, are interested in imports valued below 2½c. a lb., such steel representing more than 99 per cent of the domestic production, while tool and fine steels represent 0.5 per cent in volume. At the end of the war, Doctor Mathews declared, about 40 plants were making tool and fine steels. Eleven of those were declared to have gone out of business and most of them have been scrapped. Two other companies were said to have undergone two complete reorganizations with loss to the stockholders and one was said to have undergone one reorganization. The Crucible Steel Co., Doctor Mathews said, has dismantled one plant and closed down another.

Dealing with paragraph 304, relating to rates on carbon steel of a value of 2½c. a lb. and upward, Doctor Mathews urged the following changes:

Valued at 2½c. and up to 3½c. a lb. from 8/10c. to 1c. a lb.

Valued at 3½c. and up to 5c. a lb. from 1c. to 1½c. a lb.

Valued at 5c. and up to 8c. a lb. from 1 7/10c. to 2 4/10c. a lb.

Valued at 8c. and up to 12c. a lb. from 2½c. to 3 6/10c. a lb.

Valued at 12c. and up to 16c. a lb. from 3½c. to 5c. a lb.

Valued at 16c. a lb. from 20 to 35 per cent ad valorem.

The additional rate, "Provided that on steel circular saw plates, etc.," from ½c. to 1c. a lb.

Insertion of the words "seamless tubes" be made in provision for hollow bars, and hollow drill steel valued at more than 4c. a lb., and House bill duty of 1 3/10c. a lb. be increased to 2c. a lb.

In paragraph 307, rates on plates, valued at over 3c. a lb., increase from 20 to 35 per cent.

In paragraph 308, covering high grade tool and fine steel sheets valued at 3c. a lb., increase from 20 to 35 per cent.

In paragraph 313, last clause, covering "bars and strips of iron and steel in either long or short lengths not especially provided for," increase from 25 to 35 per cent.

In paragraph 315, on material valued at over 4c. a lb., which the House bill increased to 20 per cent, increase further to 35 per cent; increase additional of ¼c. on material "tempered, treated or partly manufactured" to ½c. a lb.; increase additional duty of ⅛c. on "cold-rolled, cold-drawn, cold-hammered or polished in any way," etc., to 1c. a lb.; increase additional extra duty of 2/10c. on "blued, brightened, tempered or polished" material to 5/10c. a lb.

In paragraph 316, increase duty on wire, valued at 6c. a lb. and over to 35 per cent.

Representing the Southern Tariff Association, George W. Armstrong, president of the Texas Steel Co., Fort Worth, Tex., resumed a plea made before the House Committee on Ways and Means for a duty of 1c. a lb. on

iron and steel bars, including reinforcement concrete grades. He also was of the opinion that all bars should be included in a single paragraph. Senators Reed and Edge said that they thought not only bars but plates and other products should be reclassified so that there would be greater uniformity as to the processed condition of the products, ranging from raw to semi-finished to finished material.

Importer Asks for Changes

George E. Dix, New York importer, president, Steel Union Co. and Sheet Piling Co., Inc., approved of the House bill providing a definite classification for rolled interlocking steel sheet piling in the structural paragraph and continuing the duty at 1/5c. a lb., and protested against the recommendation of the American Iron and Steel Institute for a duty of 5/10c. a lb. He asked that deformed or concrete reinforcing bars, specifically mentioned in paragraph 304 in the House bill and made dutiable at $6 a ton, be restored to the structural paragraph, 312, and given a duty of $4 a ton. Request also was made for changes downward in the duties on ordinary plates, baling buckles, bale ties and woven wire netting. Because they sell for the same or almost the same price as structural shapes, he asked that plates take the same duties as shapes.

In accordance with this suggestion he asked that paragraph 307 be changed and that a duty of $4 per net ton or 20c. a 100 lb. be fixed on tank plates, universal mill plates, ship hull steel plates, plates meeting standard specifications for structural steel and other plates valued at 2c. a lb.; for plates valued at over 2c. a lb. and not over 2½c. a lb. a rate of $5 per ton, or 25c. a 100 lb.; for plates valued above 2½c. a lb. up to 3c. a lb., $6 a net ton, or 30c. a 100 lb.; for plates valued at over 3c. a lb., $10 per net ton or 5/10c. a lb. He said that it is on the ordinary plates of structural or tank grade that are of no special analysis and which require no excessive extras or price that the duty of $10 per net ton appears to be excessive and burdensome.

It was declared by Mr. Dix that the schedule suggested would permit some importations of plates, especially in localities where foreign freight rates were advantageous, and where prices are now high because of the long inland freight haul from manufacturing points.

Wants Changes on Hoops, Bale Ties

Taking up paragraph 314, Mr. Dix called attention to the fact that it permits the importation of hoops and bands, cut to length, with or without buckles, for baling cotton or other commodities, the duty being 1/4c. a lb., and he asked that the paragraph be so clarified that buckles and fastenings for baling ties may be admitted at the same rate of duty as when shipped together with the hoops or bands. In the majority of cases, it was stated, buckles or fastenings are shipped with the bands or ties, but occasionally the buckles are forwarded in separate shipments, and, when that occurs, under the decisions of the Customs authorities, paragraph 399, covering "articles not specially provided for, 40 per cent ad valorem duty" is the paragraph under which the material is admitted. Mr. Dix said it would appear clearly to be the intention of Congress to admit not only the hoops and bands, but the buckles and fastenings as well.

Pointing out that the last two lines of the paragraph read, "All wire commonly used for baling hay or other commodities, ½c. a lb.," Mr. Dix said that under the ruling of the Customs division it is impossible to import wire for baling hay, for the reason that there is nothing in the nature of the wire itself, or the manner in which it is supplied, to identify ordinary wire for use in baling purposes and that therefore this portion of the paragraph is ineffective. He suggested that the paragraph be changed to read "All wire commonly used for baling hay or other commodities and all wire bale tie, ½c. a lb." A bale tie, he said, consists of a straight length of the wire with a loop twisted at one end, but under the ruling of the appraisers this is classified under paragraph 399 as "articles or wares not specially provided for, if composed wholly or in chief value of iron or steel, 40 per cent ad valorem." It was declared to have been evidently the intention of Congress to allow baling wire and bale ties of wire which are used principally by the farmers, to "enjoy a reasonable duty of ½c. a lb. instead of 40 per cent ad valorem."

Request also was made that the committee include in paragraph 318, which covers woven wire cloth and fabrics of various kinds, a provision for woven wire netting composed of steel with an ad valorem duty of not to exceed 25 per cent, "in harmony with the rate of duty provided for the much finer products already included in paragraph 318." Mr. Dix said that failure to classify and specifically mention netting in the existing law has worked great hardship on the importers and users of this class of material.

Sheet Steel Piling Competition

In discussing sheet piling, Mr. Dix said that since the hearings before the Ways and Means Committee last February several striking examples of the competitive situation on this product have come up. On June 1, it was stated, there was a public letting at Palm Beach of a sea wall to be constructed of steel sheet piling of a total length of 7330 lineal ft. There were four bidders, Mr. Dix said, at the following delivered figures: Bethlehem Steel Co., $51.20 per net ton; Sheet Piling, Inc., offering Larssen piling, made by the United Steel Co., Germany, $50; Carnegie Steel Co., $49.20; Jones & Laughlin Steel Corporation, $47.50. The business, it was stated, was placed with Sheet Piling, Inc., despite the fact that it was the next to the highest bidder, the reason given by Mr. Dix being based "on the efficiency and strength of the piling section."

It was said that it is evident that there is no price advantage by which Larssen piling is adversely affecting the American market, and Mr. Dix added that there is no justification in the demand for an increase of duty. Rather, he urged, it would be more proper that the duty be reduced.

Proposes Increase on Forgings

Appearing for the Forging Manufacturers' Association, representing 85 manufacturers of forgings, G. H. Weiler asked that the duty of 6/10c. a lb. on axles, etc., be increased to 2c. a lb. and that crank forgings be specifically mentioned.

C. Frank Schwep, Ingersoll Rand Co., New York, opposed the House provision which specifically named hollow drill steel and gave it an additional duty of 1 3/10c. a lb. when valued at over 4c. a lb. above other products named in paragraph 304. Mr. Schwep said the proposed duty will either prohibit importations of hollow drill steel or place a burden upon the mining industry using rock drills. The House bill, he said, would increase the duty $60 a ton, and make it 3c. a lb. His company, Mr. Schwep says, imports hollow drill steel from Sweden, and he stated the reason the material was imported is that it is superior to the domestic product.

Objects to Alloy Steel Rate

Representing 16 importers who receive from 90 to 95 per cent of the incoming shipments of fine steels, W. D. Thomas, New York, strongly objected to the duty of 8 per cent on alloy steel and asked that it be reduced to 2 per cent. He protested also against the provision relating to determination by Customs authorities as to whether imports were or were not alloy steel. The point was made that the provision would be confusing and difficult of administration because of the difficulty of accurate analysis. He proposed instead specific duties on the alloy content. Retention of the 8 per cent duty in paragraph 305, he said, would impose three duties on alloy steels in addition to those on carbon steels. He also protested against the duty on cylindrical steel rolls.

Mr. Thomas said that importations of fine steels are less than 2 per cent of domestic production and that the imported material was higher in price, the claim being that it is superior in quality to American-made material.

Construction work was scheduled to be started on additions to two merchant mills of the Algoma Steel Corporation at Sault Ste. Marie, Ont. The improvements will cost $2,500,000 and are expected to be completed by Jan. 1 next. The additions will about double the capacity of the two mills and increase the finished steel production by about 50,000 tons a year.

Promising Markets for Sheets Disclosed

Conference of Flat Rolled Steel Executives Last Week Devoted to Trade Extension Work

MARKED increase in interest in trade extension work was evidenced in the meeting last week at White Sulphur Springs, W. Va., of the executives of flat rolled steel manufacturers. A three-day conference, with afternoons left for golf and other recreation, brought before the makers of steel sheets and hot and cold rolled strips two analyses of potential markets and concrete suggestions to cultivate them. It heard a carefully considered estimate of the trade extension problem by President James A. Farrell of the United States Steel Corporation. It focussed on the active movement among many industries to eradicate unethical and uneconomical commercial practices by agreements among the elements of the industry either under the auspices of the Federal Trade Commission or outside its influence. The note sounded in all the gatherings was one of satisfaction in respect to the progress made in trade extension and a steadfastness of purpose to carry on in a larger way if possible. Following are some of the high points of the conference.

Analyses of Rural and Urban Demands for Sheets and Strips

IN THE IRON AGE of last week, page 1784, were outlined the early features of the meeting. These included a farm market survey presented by Ray H. Griswold, of the Griswold-Eshleman Co., Cleveland. As explained last week this indicated a potential market in galvanized roofing alone of 1,600,000 tons against a present consumption of 429,000 tons, part of which is believed to go to towns and cities. Considerable emphasis was placed on the channels of distribution, with hardware stores in the premier place by a wide margin, and on the need of better compensation for the dealers, and on the highly receptive attitude of the farmers for steel products. Besides a formidable array of charts covering consumption and distribution studies, Mr. Griswold had a number of impressive exhibits of industry advertising, which he used effectively as follows:

One long panel was headed by the legend: "Shall I buy a product made of steel or a product made of—," immediately under it being the appeals of makers of products competitive with steel. These advertisements culled from various publications were bordered by a legend below to the effect: "The answer to this question must be made by the whole steel industry speaking as one voice." Another panel was entitled, "Today's business battle is being fought between industries not between firms," and below the advertising exhibit of companies extolling various materials was the injunction: "Steel mills should fight together for more of the consumer's dollars instead of fighting each other for his dimes."

It was pointed out that among the specimens of advertising were those of fabricators dilating more or less emphatically on the fact that steel entered into their products. The conspicuous illustrations of this class were advertisements of the General Electric Co., particularly of the company's electric refrigerator of which the all-steel character was advanced as a factor of prime importance. A letter from the company gave credit to the flat rolled steel makers campaign for stressing the idea of steel in its selling efforts.

Howard Spohn, of the Gardner Advertising Agency, New York, presented charts covering preliminary studies into the market possibilities of sheet steel and strip steel in the general field. They touched on steel furniture, shelving, steel lath (consumption of 110,000 tons a year against prospects of 569,500 tons), barrels, tote boxes, enameled wall tile, steel ceilings, roof decks (360,000 tons potential and 15,000 tons actual), doors and trim, steel industrial buildings, toilet and shower partitions, office and factory partitions, metal lumber, box and refrigerator cars, boiler jackets, trucks, etc.

Summed up, the two speakers left the impression that both the rural and urban markets presented broad fields for cultivation, the one measured in part by its annual creation of new wealth to the amount of 20 billions of dollars and the other as offering a 7-million ton consumption where now it takes but 535,000 tons. Both were convincing that manufacturing steel consumers are beginning to see the value of stressing steel as a point in selling. Also, as was mentioned in last week's account, it was urged that fabricators be induced to use slogans in their trade development work; the advertising of the flat rolled steel makers, as explained, is in part written around "save with steel" arguments in reaching the general buyer and around "galvanized steel protects" in rural campaigns.

Mr. Farrell on Trade Development

MR. FARRELL addressed himself to the same topic of trade development and his remarks substantially in full were as follows:

"The work of trade associations, properly performed, is useful. The American Iron and Steel Institute, since its inception, has endeavored to bring about friendly intercourse among its members, and cooperation in technical research, which have been of vast benefit during the 20 years of its existence. Any efforts designed to promote new uses of steel products or to expand their present usage, to assist both the manufacturing and consuming trade to a better understanding of the problems of initial manufacture and re-manufacture, are worth while.

"There has been an increased trend in recent years toward the formation of trade associations covering practically every line of manufacture and many commercial activities. It is said that there are some 15,000 of these associations in the United States. It is to be hoped that in their operations and ramifications the inhibitions imposed by our laws will be scrupulously observed.

"It is gratifying to note in this connection the helpful attitude of the Federal Trade Commission following further interpretations of the Sherman Law by the Supreme Court. The hearings which have taken place at the request of a number of these associations have no doubt served to clarify the limitations of these associations as to their methods of operation and permissible functions.

"It is obvious that the American Iron and Steel Institute can only serve as a general clearing house for the exchange of thought and plans for the benefit of the industry as a whole. It must be left to individual and company initiative, and the mutuality of efforts in respective lines of manufacture, to develop the respective interests of the several sections of the steel trade.

"There is a serious and important aspect, however, as to the extent to which the industry should actively participate other than in technical discussion and research. The border line of collaboration under the law, when such cooperation might be interpreted by the courts as restraint of trade, does not seem to have been

clearly defined. It is realized that one of the purposes of the Federal Trade Commission is supposed to be to clear up such mysteries; but it is not understood that their suggestions offer more than helpful aid to those seeking such assistance in formulating methods and plans to come within the law.

"Without wishing to discuss at this time the practical advisability of business associations seeking any measure of control under governmental auspices, in the expectation of having a mantle of legality enshroud its operations, it appears to some well informed observers that it is not essential or desirable to solicit that form of governmental intervention in business.

How Large Companies Can Assist

"Another trend of the times appears to be toward the merger or consolidation of manufacturers having collateral interests; and when these have been and can be accomplished legally, it would seem that the integration thereby made possible would serve in a large measure to accomplish the purposes of disintegrated organizations seeking through an association the solidarity in research and technical development which is economically beneficial.

"It would therefore remain for the larger companies with their effective bureaus of research, sales and advertising, to assist by every proper means the efforts of associates in similar lines of work to promote the common interest in the more intelligent use and distribution of their product. This assistance might well comprise through collaborative and cooperative efforts to accomplish a stabilization of practices, costs and compensatory returns on investment.

"It is felt that such reciprocal effort will enable the industry, with their facilities for the accomplishment of similar purposes, to develop every possible means of improvement to the industry, and in collaboration to stimulate and promote customer uses of product, with such exchange of data and result with associations of its competitors as may be found proper and expedient.

"It would seem that the units of the industry itself should have sufficient respect for each other's welfare voluntarily to refrain from unfair trade practices inveighed against by numerous associations which have sought the assistance of the Federal Trade Commission and by close observance of ordinary commercial ethics and reciprocal consideration.

An Industry's Excessive Claims of Superiority

"Remedies of any ills affecting our business are in our own hands. For instance, the orgy of excessive claims for the superiority of products differing but slightly, if at all, from those of other manufacturers, has assumed fantastic proportions. It incites competitive and expensive effort along similar lines by all competitors, with a mass of assertions and refutations which in the end merely serve to confuse the mind of the buyer or promote harmful conflict among manufacturers. If this is intended to be a challenge as to the lengthiest pocketbook in advertising achievement and promotional publicity, the challenge will of course be met by the interests who naturally resent insinuations as to the superiority of competitive product or the inferiority of their own. It is in effect a form of salesmanship universally abhorred, of decrying the wares of a competitor, or vaunting unfounded or unprovable claims of excellence of products whose chief merit may be in the assumption of a peculiar or meaningless name.

"Possibly much of this competitive effort as been instigated by extraordinary pretentions of those who offer substitutes for steel and attempt to convince the public, and especially readers of literary journals, instead of readers of technical publications, which would seem to be the logical media for imparting technical information that the world has at last found what it has been waiting for.

"The only result from these claims is likely to be at the expense of the long-suffering industry, which has only recently emerged from the blight of over-capacity, under-consumption and meager profits. You can hardly term such effort as unethical, but rather as unnecessary and inadvisable. One of the best achievements which associations in the industry could accomplish would be to frown on illogical and unwise claims in selling policies.

"There is much to be said as to the advantages of association work to both makers and consumers in assisting toward proper publicity methods in refuting visionary suggestions of the superiority of substitutes; but much of this work would be minimized if the members themselves refrained from claims irreconcilable with the facts.

"Another boomerang to be averted, if possible, is the stimulation of unnecessary capacity through exciting ourselves over the prospect of more than a normal increase in annual average consumption consequent upon growing population and prosperity.

"There is a wide line of demarcation between normal and natural efforts to protect our industries and expand the use of their product along sane and normal lines, with due regard for the interests of others—and a scramble for business, with a heavy and burdensome budget of questionable utility, on the assumption of an unlimited increase in demand.

"There have been occasions in our industry when we were inclined to be more fearful than hopeful. At such moments we have felt that our business had fallen on parlous times; at such times the future of our industry was not pleasant to contemplate, but we recover quickly from moods of this sort. At present and for some time past we have had capacity operations. The indications are that we will have a reasonably full operation for some time to come. When business does slacken, we should act well and wisely. There is no reason why reasonable profits should not accrue on a less rate of operation.

"Until we have gained the wisdom, which we have not always had, of being satisfied with our normal share of the business going, we can do the industry incalculable damage and retard its normal development. We should by this time have attained that control of ourselves which will avert its misapplication to unbusinesslike methods and its resulting consequences. If we are seeking permanent economic factors they can be largely accomplished through cooperation."

Other Notable Addresses

The attitude of cooperation and general helpfulness now so conspicuous on the part of the Federal Trade Commission and its fostering of trade practice conferences were discussed at length at a banquet given by the association to members and guests on Monday, June 24, by the Hon. W. E. Humphrey, of the Federal Trade Commission.

Severn P. Ker, president, Sharon Steel Hoop Co., presided at the banquet and at the Wednesday morning session. The most important thing the steel industry has to do, said he, is to care for distribution. The executives today, in his opinion, are giving closer attention to distribution problems than at any time in the past, and he said there are signs of their desire to help industry as a whole. He regarded they had no other obligation than friendship for their associates and interest in the industry.

In introducing Mr. Farrell, he described him as knowing more of trade development than any one else. He referred to his efforts to export steel and how he proved able all alone to build up the export organization of the United States Steel Corporation two years after the formation of the corporation, resulting in a taking of 3,000,000 tons of steel off the American market and sending it to the world against low cost labor. Mr. Farrell, he said, is the undisputed chief executive officer of the greatest steel corporation of the world.

Among the notable addresses of the conference was that of George H. Charls, president of the National Association of Flat Rolled Steel Manufacturers. So well received was it that special requests were made from the floor that copies be made available for careful reading by all of the manufacturers, members and nonmembers alike. Those who entered into the discussion included C. R. Hook, vice-president and general manager, American Rolling Mill Co., Severn P. Ker, W. S. Horner, vice-president, American Rolling Mill Co., Walter E. Watson, Youngstown Sheet & Tube Co., F. C. Gifford, vice-president and general sales manager, Acme Steel Co., Chicago, A. N. Flora, of the association, Frank R.

Frost, of the Superior Steel Corporation, and others. What Mr. Charls had to say respecting trade extension is as follows:

Defines Rational Trade Extension

"Trade extension has been removed from the plane of intellectual abstractions and the sphere of the intangible. It has become a concrete, effective, recognized function of modern business.

"Cooperative trade development is no longer the abstract theorem among the problems of industry. It remains so only to those who willfully insist on remaining blind to its merit, or those who are frankly uninformed and unversed in its mechanism, operations and outstanding achievement.

"Collective trade extension has become a vital force for the protection of an industry and the preservation of its future. It not only extends the demand for the product of an industry, but it extends the very life of the industry itself.

"If charlatans have made it an abstruse affair, practical salesmanship and business ingenuity have unscrewed the inscrutable, exposed the hokum and vitalized the practical. It is no longer a speculative truth, that judiciously expended time and money in trade extension expands markets, but a fact which has been demonstrated.

"Regardless of the just criticism that vast sums of money have been wasted in misguided and misdirected efforts of trade extension, out of these mistakes have come a true knowledge of how to spend money judiciously to produce actual results in holding and creating new markets.

"In our industry, the responsibility of each and every corporation producing flat rolled steel to put its shoulder to the wheel, in our efforts to extend markets for our products, must be realized, appreciated and acted upon. Each must realize how effective he makes the whole by being a part of it—how doubtful he makes the plan by being out of it.

"If we are going to do this work in the biggest, most effective way, the industry expects every unit within it to do its duty.

"Our conception of trade extension advertising is to keep it on a purely educational basis and to hold it to the exploiting of the utility, beauty, weight saving, space saving, uninflammable nature of products made from steel and, most important, to make it a powerful force in influencing all fabricators of steel products and their distributers to increase their sales and advertising efforts, so that a $500,000 trade extension program on sheets, strip sheets, hot rolled and cold rolled, will bring about an expenditure of $5,000,000 among all those who buy the flat products—devoted to influencing the minds of 120 millions of people in favor of steel as opposed to competing products."

Eugene P. Thomas, vice-president of the United States Steel Corporation, in charge of sales, supplemented the speech of President Farrell by stating that the results of the extensive research work in progress by the Steel Corporation would be placed ultimately in the possession of the industry as a whole. He discussed also how the workings of the cartels and syndicates abroad, institutions not permissible here, had been helpful in promoting larger uses of manufactured as well as primary forms of steel, until the consumption of the non-manufacturing steel countries was last year 20 million tons, or 25 per cent more than in the preceding year, which year showed an increase of 13 per cent over its predecessor.

National Fuels Meeting to Be Held in Fall

Engineers interested in fuels, whether from the point of view of production or of utilization, will meet in Philadelphia, Oct. 7 to 10, under the auspices of the American Society of Mechanical Engineers. This will be the third National Fuels Meeting which that society has sponsored. Among the subjects to be covered are the following:

Economics of reclamation of anthracite culm.
Burning refuse fuels.
Low-temperature carbonization.
Atomic basis of combustion theory.
Economics of gas, coal and oil fuels.
Economics of oil production.
Heat value of fuel.
Coal pre-treatment.
Slag accumulations on boiler tubes.
Air needed for combustion of different fuels.
Design of furnace for tunnel kilns.
Development of refractories to meet needs of users.
Producer gas in brick kilns.
Burning pulverized anthracite.
Recent developments in stoker design (four papers).
Burning coarse coal in supension.
Proper methods of pulverized-fuel sampling.
Methods of recording smoke (three papers).

Refractories Institute Elects Officers

At the annual meeting of the American Refractories Institute on June 25, in Cleveland, the following officers and directors were elected: President, P. S. Kier, Kier Fire Brick Co.; first vice-president, W. B. Coullie, Harbison-Walker Refractories Co.; second vice-president, Roger A. Hitchins, General Refractories Co.; treasurer, C. C. Edmunds, McLain Fire Brick Co.; secretary, Dorothy A. Texter, Oliver Building, Pittsburgh.

Directors for the three year term 1929-1932: U. S. Clark, Howard Co.; G. R. McClintock, Osceola Silica & Fire Brick Co.; P. S. Kier, Kier Fire Brick Co.; E. F. Myers, Ironton Fire Brick Co.; J. Claire Evans, Denver Fire Clay Co.; J. T. Roberts, Stockton Fire Brick Co.; J. L. Green, Laclede-Christy Clay Products Co.; C. H. King, Evens & Howard Fire Brick Co.

New England Foundrymen to Meet at Taunton

The July meeting of the New England Foundrymen's Association will be held Wednesday, the tenth, at the Wampanoag Motor Club, Taunton, Mass. Following a luncheon, golf matches will be run off, and there will be a baseball game and other sports. The dinner in the evening will be informal. Luther Anthony, Glenwood Range Co., is chairman of the entertainment committee.

Industrial Conference to Be Held at Lake Geneva

The twelfth mid-western industrial conference will be held at Lake Geneva, Wis., July 18 to 21, inclusive, according to an announcement by J. A. Hiller, executive secretary of the conference, 19 South La Salle Street, Chicago. The 1929 program is planned for senior and junior executives and their representatives, and for the first time the labor group, which heretofore has been excluded from the conferences, will participate.

Westinghouse Agent Jobbers Elect Officers

Karr Parker, treasurer and engineering manager McCarthy & Ford, Buffalo, was elected president of the Westinghouse Agent Jobbers Association at its seventeenth annual meeting at Hot Springs, Va. Other officers named were E. D. Kilburn, vice-president Westinghouse Electric & Mfg. Co., vice-president; H. M. Gansman, vice-president H. C. Roberts Electrical Supply Co., Philadelphia, secretary; and H. T. Pritchard, merchandising department, Westinghouse Co., Mansfield, Ohio, assistant secretary and treasurer.

The following were elected members of the executive committee: A. E. Allen, vice-president Westinghouse Lamp Co., New York; Samuel Adams Chase, special representative Westinghouse Co., Mansfield; W. I. Bickford, president Iron City Electric Co., Pittsburgh; B. E. Finucano, general manager Rochester Electric Supply Co., Rochester, N. Y.; W. W. French, vice-president and general manager Moore Handley Hardware Co., Birmingham; M. C. Morrow, sales manager merchandising department, Westinghouse Co., Mansfield; T. J. Pace, director of sales, Westinghouse Co., East Pittsburgh, Pa.; J. C. Schmidtbauer, president Julius Andrae & Sons Co., Milwaukee; C. E. Stephens, northeastern manager Westinghouse Co., New York; N. G. Symonds, northwestern manager Westinghouse Co., Chicago; and Walter Williamson, vice-president and general manager Alpha Electric Co., New York.

New Automatic Chucking Machine

Hydraulic Feed Mechanism Applied to Both Platen and Automatic Indexing Turret Types

AN automatic chucking machine featuring hydraulic feed, has been brought out by the Foster Machine Co., Elkhart, Ind., under the trade name of Fastermatic. It is built in platen and automatic indexing turret types, each of which is available in four sizes, with 17, 22, 25½ and 33-in. swing over the bed, respectively.

Feeding of the tool-carrying units is actuated by a ram or piston inclosed in a hydraulic cylinder into which oil is forced by an Oilgear pump. The pump is located on the head end of the machine and is driven through silent chain from the main drive shaft. During the period of feeding, positive pressure is maintained on each side of the piston, the back pressure on the side of the piston opposite to that to which the feeding pressure is applied being necessary to maintain uniform feeding movement to the tooling when the cuts are intermittent or of irregular depth. These pressures are regulated automatically through the action of the Oilgear unit.

Feeds range from 0 to approximately 40 in. per min. The feed changes are effected through varying the capacity of the pump and its delivery of oil to the piston. Adjustable cams are provided for obtaining the desired feed. The arrangement provides for automatic rapid return of the tooling from the work at the completion of machining operations, as well as for rapid approach of the tooling into position for beginning the cuts. At the completion of the cycle, the tooling is retained in the returned position until the feed is re-engaged by hand. Rapid traverse can be effected automatically during any part of the feeding movement, which reduces the time on pieces having wide spaces between bored or turned lengths.

The tool-carrying units of the platen type machine consist of a front and a rear cross-slide and a main slide, all of which are mounted on a platen. Actuated by the hydraulic mechanism, the platen carries the tooling into position for beginning the machining operations, and away from the work, to the initial starting position, after the tooling units have receded. Although ordinarily rapid, the movements to the platen are fully controllable and, when desirable, can be reduced automatically to any rate of travel that may be required for feeding auxiliary tooling bolted to the platen.

With the indexing turret type Fastermatic the tool-carrying units consist of a front and a rear cross-slide, mounted on a bridge that spans the bed, and an automatically indexed hexagon turret. The cross-slides are adjustable longitudinally.

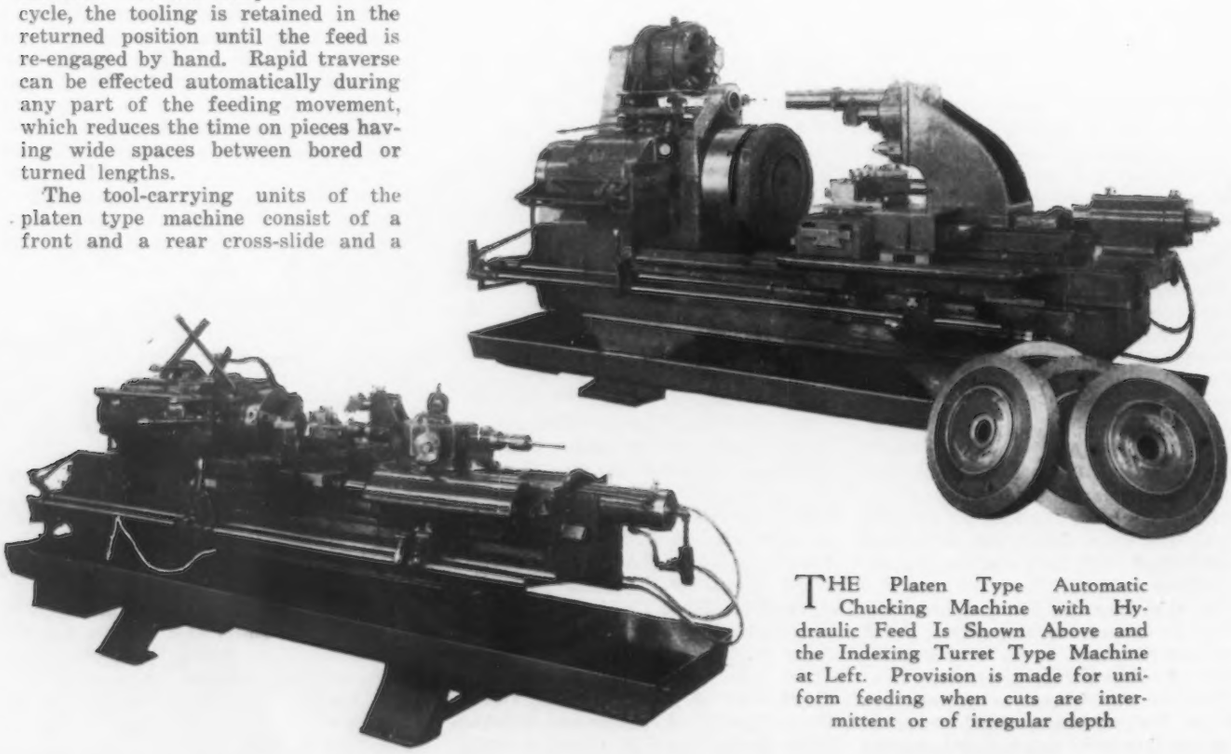
The hexagon turret advances and returns automatically, and the entire action is effected by means of the ram in a hydraulic cylinder located between the ways at the rear. A rapid traverse places the turret in position for starting the boring and turning operations; from this position the turret continues to feed at a predetermined rate. Longitudinal movements of the turret are controlled by cams, one for each face. The cams are carried on a spool and index automatically in correct relation to the faces of the turret. Each cam is adjustable and a separate and independent feed for each face of the turret is readily available. The turret can be adjusted to remain at any fixed return position, or the full travel backward and forward may be accomplished without indexing.

The cross-slides can be operated simultaneously or independently, and can be timed to operate in conjunction with any of the turret faces. The cross action is effected by cams beneath the slides and is controlled by the movement of the turret. At the completion of the cycle the entire tooling is moved clear of the work until the feed is re-engaged by hand. Provision is made for the use of both overhead and centrally piloted tooling, and chucks such as usually used on lathes are readily adaptable to these machines.

Eight spindle speeds are obtainable on the Nos. 1-F and 2-F machines, and 12 speeds on the Nos. 3-F and 4-F. All of the machines are equipped with Timken bearing spindles, ball-bearing back shafts, multiple-disk clutches and steel gearing that runs in oil.

Competitive Exhibit of Plated Finishes

AN exhibit of metals finished in nickel, copper, brass, silver, lead, cadmium, gold and chromium is being sponsored by the American Electroplaters' Society of America for its seventeenth annual convention, Hotel Statler, Detroit, July 8 to 11. This competition will take the place of the usual supply men's exhibit. Three prizes will be awarded to firms submitting best samples of electroplated metal. The usual technical and educational features of these conventions are to be continued.

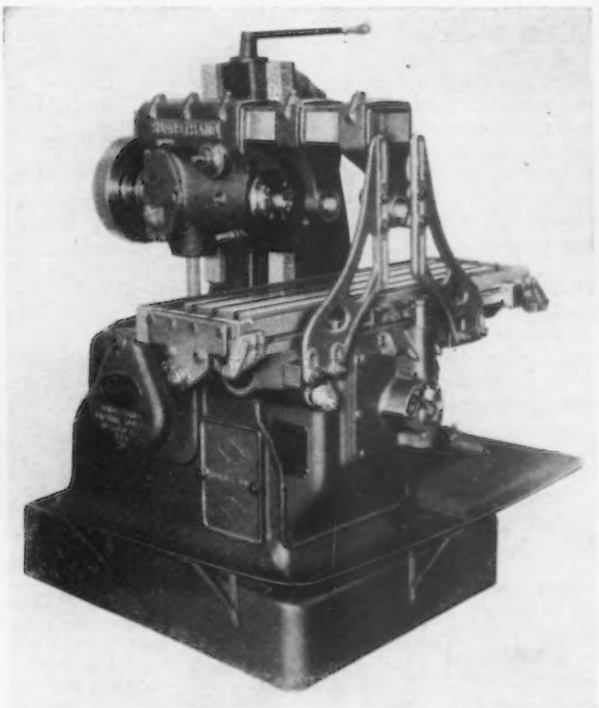


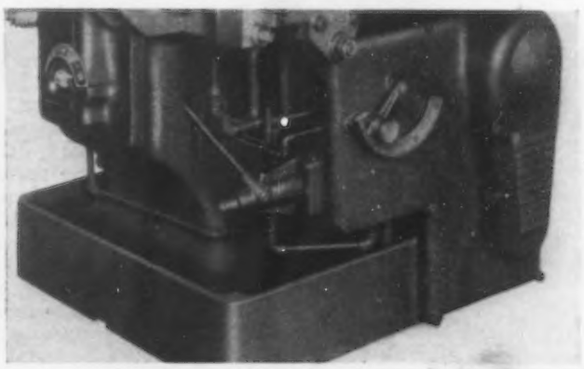
THE Platen Type Automatic Chucking Machine with Hydraulic Feed Is Shown Above and the Indexing Turret Type Machine at Left. Provision is made for uniform feeding when cuts are intermittent or of irregular depth

New Rigidmil Has Hydraulic Feeds

Feed Range Is From 0 to 50 In. and Rapid Traverse 103 In. Per Min.—Mechanical Feed Also Furnished

FOR both general purpose and high-production milling operations, the Sundstrand Machine Tool Co., Rockford, Ill., is bringing out a new Rigidmil that is slightly smaller than its No. 3 machine and is equipped with hydraulic table feed. Mechanical feed can also be furnished, the machine being readily changed from one type of feed to the other at any time.





Manual Feed Control Levers Are Shown in View Above. The lever at left controls the direction of feed and rapid traverse, and that at right the rate of feed

Hydraulic feed is obtained by means of an Oilgear pump in the base of the machine. It provides an extensive variety of feeds within the range of 0 to 50m. per min., rapid approach, automatic relief if the cutter becomes overloaded, dwell at completion of cut; and automatic quick return to starting position. Rapid traverse is at the rate of 103 in. per min. The feed rate best suited to the work can be obtained instantly. When the cutter is overloaded, the hydraulic feed automatically retards and then accelerates to the set rate when normal conditions return. The manual control of feed is through a lever on the front of the saddle, and may be set in five positions: Rapid traverse, to left; feed, to left; neutral; feed, to right; and rapid traverse, to right, the direction of feed or rapid traverse being the same as the lever movement.

Automatic table control is governed by two stop blocks with nine dogs located between them, all adjustable. The blocks will cause the table feed to throw-out within plus or minus 0.002 in. of a selected point. The dogs may be used in various combinations to obtain any desired cycle of feed and rapid traverse.

The mechanical feed unit comprises a gear box for pick-off gears and a longer drive shaft than used with the hydraulic unit. Three pairs of pick-off gears for six feeds, from 1.49 to 22 in. per min., are supplied as standard.

The base-column-saddle casting is made in one piece. The spindle-head is compact and is mounted on the column with narrow guides for alinement. The forged steel spindle carried in Timken bearings front and rear, has the National Standard nose, with hole 2¾ in. in diameter at the large end, and 3½ in. taper per ft. The entire spindle assembly is carried in a hardened and ground steel quill and has 4-in. traverse adjustment.

Smooth spindle drive is obtained through a coarse pitch spiral-bevel pinion and gear, the pinion and shaft being of one piece and mounted in Timken bearings. Pick-off gears, located in the main casting just below the column, provide changes of speed and direction of rotation for the spindle. A fly-wheel on the spindle serves to minimize vibration and chatter from heavy or irregular cuts. The overarm is a solid steel rectangular forging and is adjustable by a rack and pinion.

The main drive clutch of multiple disk type, is compact and sensitive; it runs in a bath of oil and is easily adjusted. The drive is by motor only, a 5-hp., 1200-r.p.m. motor being recommended. The motor is mounted in the base on an adjustable plate and drives the primary shaft through a silent chain. Coolant is contained in a large reservoir in the main casting of the machine. Extra equipment includes a vertical spindle-head and rotary table.

Specifications include: Table working surface, 14½ x 50 in. standard, 14½ x 70 in. special; spindle adjustment, 10¾ in. vertical, 3 in. horizontal; and distance center of spindle to overarm, 6½ in., to table 13⅜ in. maximum and 2⅝ in. minimum. The distance of the spindle face to the outer edge of the table is 14⅜ in. maximum and 11⅜ in. minimum. The distance from the floor to the top of the table is 35 in. The net weight of the machine, which is designated as the No. 30, is 5100 lb.

Side-Discharge Billet Heating Furnace

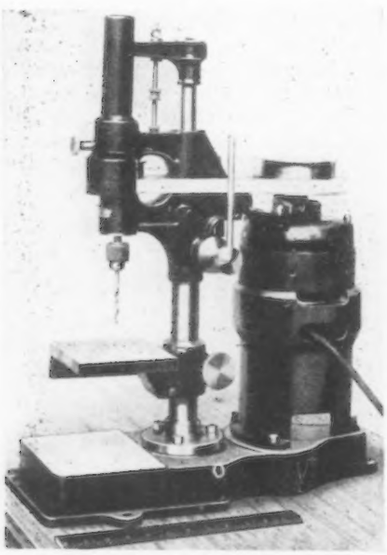
At its new strip mill at Leechburg, Pa., the West Leechburg Steel Co., Pittsburgh, will install a double-fired billet heating furnace. It will be built by the Rust Engineering Co., Pittsburgh, will heat billets and slabs 20 ft. long and will be charged and discharged from the side. Zone control firing will be employed to obtain flexibility in operation with minimum scale losses, despite the varying tonnages of steel heated. The mill will operate at rates ranging from 10 to 25 tons an hour, according to the order being rolled.

Two tiers of burners will be employed, one heating the small soaking chamber at the discharge end which controls the temperature of the discharge steel. The secondary firing ports are to be located behind the soaking chamber and the firing rates are varied in accordance with the tonnage to be heated.

The increasing use of X-rays to determine the internal structure of steel castings, aluminum castings, metal transmission tubes and a variety of other metal objects is described in a booklet entitled "X-rays in Industry," published by the Eastman Kodak Co., Rochester, N. Y.

High-Speed Sensitive Drilling Machine

A NEW high-speed precision sensitive drilling machine that will drill holes up to ¼-in. in diameter to the center of a 6-in. circle is being manufactured by the High Speed Hammer Co., Rochester, N. Y. Spindle speeds of the standard machine, designated as the model R-53, are 2700 and 5500 r.p.m.; with three step pulleys available as extras, speeds of 1500, 3000 and 6000 r.p.m. are obtainable.



The Capacity Is for Holes Up to ¼ In. Standard speeds are 2700 and 5500 r.p.m.

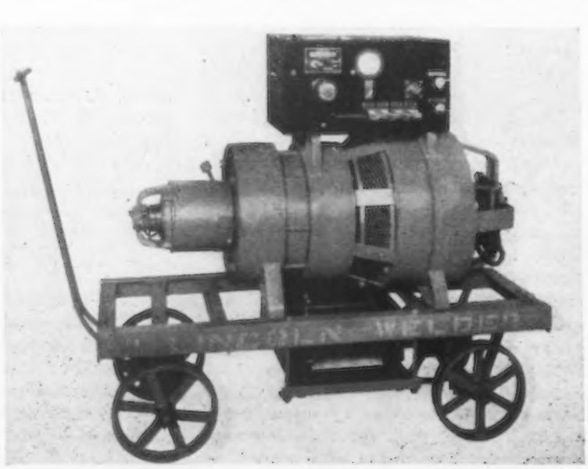
The hardened and ground spindle is guided by a vertical quill supported by ball bearings which take all belt pull. Two ball thrust bearings carry the top of the spindle at the feed arm. The parts ground accurately to size and alinement include the spindle, quill, feed column, main column, table (horizontal surface and apron), and base. Spindle travel may be set accurately by means of a depth gage provided; the maximum travel 2¼ in. The table can also be quickly adjusted in height, or entirely removed if necessary. It has a self-cleaning taper to prevent injury to the ground main column by chips. The base measures 10 x 20 in. overall and has a ground working surface 4 in. x 6 in.

Either direct or alternating current motor can be furnished. Extra equipment includes a foot treadle and rod and a pedestal base. The overall height of the machine illustrated is 24¼ in. and the weight 108 lb. net.

New "Stable-Arc" Welder Has Unified Control

UNIFICATION of the controls of both motor and generator, making for simplified operation, is an outstanding feature of the new "Stable Arc" welder recently placed on the market by the Lincoln Electric Co., Cleveland. The control mechanism is inclosed in a ventilated steel cabinet, while hand regulators and switches are mounted on the panel that forms a side of the cabinet. The control panel contains rheostat regulator, diverter switch, safety starter switch, volt-ammeter and wing-nut cable terminals. In being mounted directly over the motor generator, the control cabinet is not only accessible, but also permits removal of the motor generator armature without disturbing any other parts. In addition, it makes possible use of shorter chassis frame or base than in previous models of the "Stable Arc" welder. The shorter base offers the advantage of less floor space occupied by the welder, as well as smaller turning radius for the portable models.

By means of the volt-ammeter provided the voltage and amperage may be read from the one dial. This volt-ammeter is said to assure longer instrument life because it eliminates use of a separate delicate ammeter that would be given excessive wear on a Lincoln welder due to large output keeping the ammeter jammed against the high limit pin on the dial. Terminals for the lead cables are equipped with winged nuts, which facilitates making connections, especially when it is desired to reverse the polarity of welding current, and eliminates the necessity of a switch for reversing polarity. The company's new safety push-button switch, which eliminates accidental starting, is also a feature of the control mechanism of the new machine. Inclosed wiring of all operating controls, as well as a metal-backed rheostat, are made possible by the unified control cabinet.



Mounting the Control Cabinet Over the Motor-Generator Facilitates Operation, and Permits Removing Generator Armature Without Disturbing Other Parts

Devises Cutting-Torch Tip for Removing Rivets

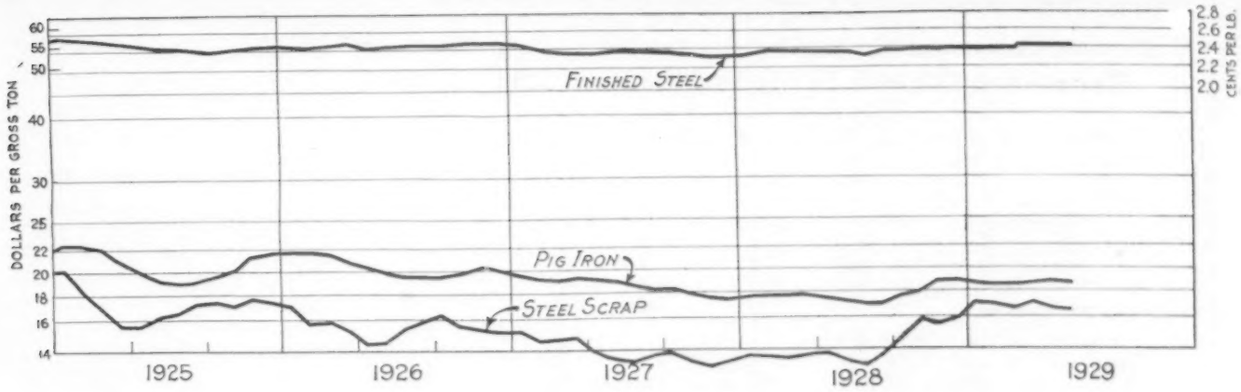
REMOVAL of 7/8-in. rivets at the rate of 7 to 9 per min. is claimed for the rivet piercing tip brought out recently by the Alexander Milburn Co., Baltimore, for use in connection with cutting torches.

The device, which is interchangeable with other forms of tips used on such torches, is centered over the rivet head and the head preheated to the melting point, which results in the forming of a ring as shown. Simultaneously, the body of the rivet is pierced and, due to the expansion and contraction of the plate, the rivet drops out or may be backed out with slight effort. These operations leave the sheet or plate uninjured and are said to meet inspection and tests required by the I. C. C. regulations. Savings in gas and minimum loss of side-sheets due to imperfect cutting, as well as increase in speed, are claimed for this method of rivet removal. The tip is of one piece and of non-flashback design.

The Rivet Piercing Tip Is Interchangeable with Other Tips. The ring formed in cutting the rivet head is shown above

Philadelphia offices of the Diamond Machine Co. and Builders Iron Foundry, affiliated companies, have been removed to 903 Riverson Building. Main plants are at Providence, R. I.

Scrap Prices Have Held Closely to Those for Pig Iron for Nearly a Year. By contrast finished steel has varied scarcely at all in the past several years



Scrap Prices Drop from Peak

Steady Decline from Early April Brings Second Quarter Below First—April Highest Month of First Half

AVERAGE prices of heavy melting steel scrap at Chicago, Philadelphia and Pittsburgh reached a spring peak the first week of April and held it until after the middle of the month. Since then there has been a practically uninterrupted decline until the end of June. The average for April was the highest for any month since the close of 1925.

Maximum prices on the weekly basis were reached at the end of January, but the April average was higher than the January average. It stood at $17.18, and the level has since fallen to $16.39 for June. The last quotation in June was $16.33.

For the second quarter of the year the average price was $16.70. This shows a decline from the $16.90 average for the first quarter. With that exception it was the highest since 1925.

Meanwhile, the average price for pig iron was somewhat higher for the second quarter than for the first—$18.62 against $18.39—also being at the highest level since the second quarter of 1927, when $19.07 was registered.

Finished steel has undergone few price changes since early in 1927. The entire second quarter of this year had the one figure of 2.412c. a lb., and the entire first quarter had 2.391c. a lb. The present price of 2.412c. is the highest since 1927, while the lowest in that period was the 2.318c. average of January, 1928.

Comparative figures for the past 18 months covering steel scrap, pig iron and finished steel are given in the table. The diagram carries the story of these changing prices over a period of four and a half years.

COMPOSITE PRICES

	(Gross Ton) Steel Scrap	Pig Iron	Finished Steel, Lb.
1925 average	*$17.12*	*$20.58*	*2.465c.*
1926 average	*15.48*	*20.42*	*2.439c.*
1927 average	*14.00*	*18.55*	*2.357c.*
January, 1928	13.70	17.63	2.318c.
February	13.71	17.73	2.361c.
March	13.65	17.73	2.362c.
April	13.81	17.67	2.359c.
May	13.90	17.45	2.350c.
June	13.52	17.23	2.341c.
July	13.13	17.10	2.325c.
August	13.75	17.11	2.348c.
September	14.75	17.54	2.348c.
October	15.85	17.94	2.363c.
November	15.73	18.46	2.368c.
December	15.97	18.51	2.385c.
Year's average.	*14.29*	*17.67*	*2.352c.*
January, 1929	17.02	18.43	2.391c.
February	16.96	18.38	2.391c.
March	16.71	18.36	2.391c.
April	17.18	18.52	2.412c.
May	16.54	18.70	2.412c.
June	16.39	18.65	2.412c.
Half year	*16.80*	*18.51*	*2.402c.*

New Records in Steel Barrel Production and Shipment

WASHINGTON, June 28.—Production and shipments of steel barrels in May, totaling 836,532 and 834,699 units respectively, established records since these data were first compiled by the Department of Commerce, from the beginning of 1925. Output was at the rate of 72 per cent of capacity. The previous records in production and shipments were made in April, according to the Department's figures, and amounted to 771,584 and 775,481 units respectively, operations being at the rate of 64.8 per cent of capacity.

Unfilled orders at the end of May for delivery within 30 days amounted to 316,882 barrels, against 333,614 at the end of April, while unfilled orders for delivery beyond 30 days were 899,090 and 935,430 barrels respectively. Stocks at the end of May were 56,936 barrels, compared with 55,103 barrels at the end of April.

Production during the first five months, representing 58.8 per cent of capacity, totaled 3,476,171 barrels, against 2,995,813 barrels for the corresponding period of last year, at 52.5 per cent of capacity. Shipments were 3,465,700 and 2,989,834 barrels respectively. Production showed a gain of 16 per cent and shipments a similar gain.

Mileage Rates on Slag Are Proposed

WASHINGTON, July 2.—A mileage scale to cover rates on slag from Reading and Swedeland, Pa., is proposed in a report by Examiner Joseph G. Cooper to the Interstate Commerce Commission, made public last week. The scale runs from 100 to 350 miles, with the scale ranging from $1.50 to $2.50 a ton and would be subject to the addition of 70c. a ton for hauls involving carfloat or lighterage services in the New York harbor district. The report was made in connection with a complaint by Cartier & Sons Co., Providence, R. I. The examiner held that rates on slag from all points involved were not unreasonable, but that those from Reading and Swedeland would be unreasonable in the future to the extent they exceeded those proposed in the scale. Other origin points named in the complaint are Hokendaqua and Bethlehem, Pa. Destination points were Providence, Auburn, Esmond and Cranston, R. I.

Chicago Employment Shows Slight Gain

Volume of employment of factories in the seventh Federal Reserve District showed a slight increase for the period April 15 to May 15, but was offset by a decline of 1.4 per cent in the amount of payrolls. The metals and metal products group, says the report of the Federal Reserve Bank of Chicago, reported a slight decline in the number of men employed, the first since July, 1928.

Further expansion in the form of an addition of 35,000 sq. ft. of manufacturing space has been announced by the Surface Combustion Co., Toledo, Ohio. This will give the company a combined floor area for production purposes of 90,000 sq. ft.

Steel Capacities by Districts Published

Interstate Commerce Commission Compiled Data in Its Review and Decision in the Freight Rate Case

IN its decision and review of the rate structure investigation as applying to iron and steel products, the Interstate Commerce Commission published several tables giving ingot capacities by districts and cities, also capacities for manufactured iron and steel articles. These tables are reproduced below.

The accompanying tables give the rated ingot and finished steel and iron capacities by districts and by cities:

Producing Points	Ingot Capacity (Gross Tons)	Capacity for Manufactured Iron and Steel Articles (Net Tons)
EASTERN DISTRICT:		
New England—		
Worcester, Mass.	180,000	172,000
Bridgeport, Conn.	125,000	100,000
Bridgewater, Mass.	.....	35,000
New Haven, Conn.	.....	30,000
New Britain, Conn.	34,000	12,000
Eastern New York—		
Syracuse	63,160	49,300
Troy	.....	60,000
Rensselaer	.....	47,000
New Jersey—		
Trenton-Kinkora	150,000	90,000
Harrison	83,350	34,400
Perth Amboy	50,000	35,000
Maryland—		
Sparrows Point	1,020,000	480,000
Baltimore	.....	60,000
Cumberland	.....	30,000
Delaware—		
Claymont	360,000	225,000
New Castle	160,000	.....
Eastern Pennsylvania—		
Bethlehem	1,512,000	1,085,000
Coatesville	1,226,480	818,200
Steelton	776,000	130,000
Ivy Rock	529,000	125,000
Harrisburg	325,000	266,000
Philadelphia	294,540	135,000
Pencoyd	240,000	222,000
Phoenixville	225,000	150,000
Pottsville	200,000	180,000
Reading	46,128	225,000
Lebanon	.....	221,500
Burnham	165,000	45,000
MIDDLE DISTRICT:		
New York-Buffalo District—		
Lackawanna	1,824,000	690,000
Buffalo	690,000	470,000
Western Pennsylvania—		
Pittsburgh	2,144,000	2,648,040
Munhall	2,548,500	1,677,000
Johnstown	1,928,000	825,000
Duquesne	1,388,800	822,500
Woodlawn	1,140,000	840,000
Braddock	1,474,000	215,000
McKeesport	686,600	729,800
Monessen	665,000	606,000
Clairton	636,000	504,000
New Castle	770,000	232,400
Farrell	624,000	299,500
Midland	600,000	264,000
Donora	550,000	224,000
Brackenridge	372,000	218,000
Vandergrift	324,000	226,000
Butler	360,000	131,500
Etna	.....	231,000
Leechburg	.....	230,600
Elwood City	.....	226,500
Sharon	.....	205,000
McKees Rocks	.....	202,000
Economy	.....	200,000
Homestead	.....	165,000
Erie	112,500	20,000
West Virginia—		
Weirton	570,000	375,000
Benwood	453,000	157,000
Wheeling	.....	149,600
Follansbee	84,000	57,900
Eastern Ohio—		
Youngstown	5,180,000	2,486,200
Cleveland	2,631,000	1,485,400
Canton	1,070,000	912,000
Lorain	1,365,000	519,000
Steubenville	600,000	565,000
Warren	500,000	537,600
Massillon	400,000	488,000
Mingo Junction	600,000	.....
Bellaire	420,000	.....
Struthers	.....	376,000
Niles	.....	360,000
Lowelville	.....	360,000
McDonald	.....	340,000
Zanesville	.....	218,000
Toronto	92,400	53,600
WESTERN DISTRICT:		
Western Ohio—		
Portsmouth	448,000	312,000
Middletown	507,000	163,260
Mansfield	185,000	100,000
Ironton	.....	50,000
Kentucky—		
Ashland	520,000	134,480
Newport	300,000	131,000
Michigan—		
Springwells	50,000	210,000
Ecorse	.....	50,000
Indiana—		
Gary	3,240,000	2,980,800
Indiana Harbor	2,440,000	1,129,000
East Chicago	.....	220,000
Kokomo	120,000	120,000
Illinois—		
South Chicago	2,772,000	1,157,200
Chicago	952,400	598,800
Joliet	708,000	437,700
Granite City	360,000	230,000
Peoria	140,000	125,000
Alton	150,000	90,000
Waukegan	.....	190,000
Chicago Heights	86,435	101,000
Wisconsin—		
Milwaukee	.....	327,800

Summary of Steel Capacities

	Ingot Capacity (Gross Tons)	Manufactured Iron and Steel Articles (Net Tons)
Eastern District:		
New England	403,650	403,000
Eastern New York	120,160	279,000
New Jersey	329,850	341,500
Maryland-Delaware	1,579,000	795,000
East. Pennsylvania	5,688,148	4,546,450
Totals, eastern district	8,120,808	6,364,950
Middle District:		
Buffalo district, New York	2,545,350	1,399,000
West. Pennsylvania	16,789,250	13,058,250
West Virginia	1,108,000	980,900
Eastern Ohio	13,218,400	9,326,735
Totals, middle district	33,661,000	24,764,885
Western District:		
Western Ohio	1,155,000	710,760
Indiana	5,800,000	4,812,600
Michigan	57,200	332,000
Kentucky	820,000	280,480
Illinois	5,168,835	3,347,700
Wisconsin	24,500	363,800
Totals, western district	13,025,535	9,847,340
Grand totals	54,807,343	40,977,175

Capacities of 16 Other Companies

Other producing companies having an ingot capacity of 500,000 gross tons or over are shown below. These 16 companies, together with the two mentioned above, control approximately 85 per cent of the ingot capacity of the entire territory.

Name of Company	Ingot Capacity (Gross Tons)
Youngstown Sheet & Tube Co.	
Youngstown	2,400,000
Indiana Harbor, Ind.	840,000
Jones & Laughlin Steel Corp.	
Pittsburgh	1,860,000
Woodlawn, Pa.	1,140,000
Inland Steel Co.	
Indiana Harbor, Ind.	1,600,000
Republic Iron & Steel Co.	
Youngstown	1,800,000
Wheeling Steel Corporation	
Steubenville, Ohio	600,000
Portsmouth, Ohio	448,000
Benwood, W. Va.	225,000
United Alloy Steel Corporation	
Canton, Ohio	1,000,000
McKinney Steel Co.	
Cleveland	1,000,000
American Rolling Mill Co.	
Middletown, Ohio	507,000
Ashland, Ky.	330,000
International Harvester Co.	
Chicago	700,000
Lukens Steel Co.	
Coatesville, Pa.	686,480
Pittsburgh Steel Co.	
Monessen, Pa.	600,000
Pittsburgh Crucible Steel Co.	
Midland, Pa.	600,000
Weirton Steel Co.	
Weirton, W. Va.	570,000
Donner Steel Co.	
Buffalo	540,000
Alan Wood Steel Co.	
Ivy Rock, Pa.	529,000
Total	17,975,480

The Interstate Commerce Commission points out that the most important markets for steel are in the States where most of the steel is manufactured, Michigan being the sole exception, as follows:

State	Percentage
Pennsylvania	21.7
Illinois	14.32
Ohio	9.70
Michigan	8.08
Indiana	6.93
New York	5.31
New England States	3.75
New Jersey	3.23
Delaware, Maryland and District of Columbia	1.59
Virginia	1.02
Total of above	75.63

Capacities of United States Steel Corporation and Bethlehem Steel Corporation Compared

	Ingot Capacity (Gross Tons)	Per Cent of District	Manufactured Iron and Steel (Net Tons)	Per Cent of District
Eastern district, totals	8,120,808	..	6,364,950	..
Bethlehem Steel Co.	3,848,000	47.3	2,174,500	34
United States Steel Corporation	420,000	5	578,000	9
Middle district, totals	33,661,000	..	24,764,885	..
Bethlehem Steel Co.	3,752,000	11	1,515,000	6
United States Steel Corporation	14,040,300	41.7	8,941,100	36
Western district, totals	13,025,535	..	9,847,340	..
Bethlehem Steel Co.	.....	...	.....	...
United States Steel Corporation	6,720,000	51.5	5,241,300	53
Grand totals	54,807,343	..	40,977,175	..
Bethlehem Steel Co.	7,600,000	13.9	3,689,500	9
United States Steel Corporation	21,180,300	38.6	14,760,400	36

This Issue in Brief

Increased strength at ordinary and high temperatures is imparted to gray iron by adding chromium up to 0.90 per cent. Improved heat resistance qualities are probably due to presence of chromium carbide in the cementite of the pearlite.—Page 16.

* * *

Freight rate increases for short hauls will encourage motor truck transportation. Chicago steel producers expect savings as high as 50 per cent to result from motor truck deliveries, giving consumers prompter service and saving them cost of hauling from railroad.—Page 22.

* * *

Iron and steel tariff bill is evidently not satisfactory to Senate subcommittee. If majority views prevail, the schedule will be greatly changed.—Page 24.

* * *

"Orgy of excessive claims for superiority of (steel) products differing but slightly, if at all, from those of other manufacturers, has assumed fantastic proportions," says James A. Farrell. The industry as a whole suffers thereby, he says, urging trade associations to frown upon illogical and unwise claims in selling policies.—Page 30.

* * *

Decline in bank clearings may indicate the beginning of a slackening in trade, says Dr. Haney. Building activity is declining, and automobile business appears to be rounding off, he says.—Page 18.

* * *

Machinery exports decline for second successive month. May shipments out of the country were valued at 48 million dollars, against 51.4 millions in April. Total for the first five months is, however, 37 per cent above same period of 1928.—Page 70.

Airplane builder uses mild-carbon steel tubing for fuselage and tail surfaces, as it is readily welded and gives a better strength-weight ratio than low-carbon steel, at the same time being less expensive than chrome-molybdenum steel. The alloy steel is, however, used for axles, which are subjected to high bending stresses.—Page 4.

* * *

Conflict on manganese ore tariff reflects desires of senators' constituents. High-tariff and low-tariff senators in manganese ore-producing States ally against senators in steel-producing areas. Steel manufacturers favor reduction or elimination of manganese ore tariff.—Page 24.

* * *

Sharper competition for steel business in areas lying between producing centers will result from new freight rates. New schedule is largely in favor of Pittsburgh producers in the competitive territories.—Page 21.

* * *

Steel exports increase while imports decline. Exports for first five months of 1929 were 23 per cent above same period of 1928, while imports declined 11 per cent.—Page 65.

* * *

Price average of finished steel products unusually stable. It showed no change at all during second quarter. Scrap price average, however, declined in June to the lowest average monthly price this year, after reaching a three-year peak in April.—Page 35.

* * *

Machining gray iron castings results in loss of hardness. But under certain cooling conditions, high-test iron holds its Brinell hardness throughout the section.—Page 6.

Finds cast iron slightly superior to steel or wrought iron in atmospheric corrosion resistance, in majority of cases studied. Investigator points out that in soil corrosion the governing factor is the nature of the soil.—Page 8.

* * *

"Fight together for more of the consumer's dollars instead of fighting each other for his dimes," is advice given to steel producers and consumers. Makers of finished steel products are urged to develop promising markets by stressing steel as a sales point.—Page 29.

* * *

Fatigue strength of cast iron is markedly increased by oft-repeated stresses below the endurance limit. Up to 800 deg. Fahr. there is no great reduction in fatigue and tension strengths and in Brinell hardness.—Page 7.

* * *

Pig iron daily output for June averaged 2 per cent under May, having been 123,255 tons a day. On July 1 there were 218 furnaces in blast, a net loss of one for the month. New half year record was established with output of 21,621,363 tons, 3.75 per cent above previous record, made in first six months of 1923.—Page 42.

* * *

Cutting tools made of high-speed steel containing tin and arsenic will not stand up well. A. S. T. M. research committee reports. Special heats were made of steel containing 0.40 per cent arsenic and 0.40 per cent tin. Service tests of cutters, reamers and twist drills made from this steel revealed the steel to be unsuitable for the purpose.—Page 12.

A. I. FINDLEY
Editor

THE IRON AGE

W. W. MACON
Managing Editor

ESTABLISHED 1855

Swings in Finished Steel Demand

EITHER there will be a wider gap than ever between the steel making and the steel finishing capacity of the country, within a year or so, or the amount of new construction of steel making units will be quite out of line with the well considered advice given at the spring meeting of the American Iron and Steel Institute. In finishing departments no little new construction is going forward, with other work intended as soon as plans can be matured. Yet there is little new construction as to steel making.

Some definite reasons can be given for greater increase in steel finishing capacity at this time than in producing capacity. There have been remarkable swings in the relative demand for different finished steel products. Now that a half year has been completed a general review is in order. Commenting on the 1928 production statistics THE IRON AGE of May 9 noted that, while there was a large gain in total finished steel production from 1926 to 1928, there had rarely been such a period of sweeping changes in the character of steel demand. Rails, plates, skelp and miscellaneous showed substantial decreases, so that other lines had to show all the greater increases, and these increases were supplied very largely by sheets, strips and bars.

Now with another half year passed one can observe that some of these swings have continued, instead of there being a tendency back toward the 1926 distribution. While this year's total steel production promises to make a new record by a substantial margin, rails are likely to show a further decrease. Production of sheets and strips, on the other hand, has continued increasing at the remarkable pace shown in 1928.

Plate demand has reacted. It fell off from 1926 to 1928, with a decrease of 287,554 tons, while this year plates are going very strong. History indicates that we should expect wide fluctuations in plate demand, rather than a continued swing, such as there is in strips.

Within the general class of tubular goods, to complicate matters further, there are swings in processes of manufacture more than in total demand; first, the gains in seamless over fire welded, and now also the new vogue of electric welding, which started only a couple of years ago in large diameter pipe and is extending to smaller diameters.

The increasing specialization of rolling mills or finishing departments naturally adds its own contribution to the gap between steel making and steel finishing capacity. Each "finishing department" of the steel industry is generally divided into several finishing departments, making different sizes. And with it all, consumers have become punctilious as to precisely how much steel they want and exactly when they want it.

Railroad Outlay for Steel

CAPITAL expenditures of Class I railroads are summarized and discussed in a pamphlet (Miscellaneous Series No. 48) just issued by the Bureau of Railway Economics, Washington. Expenditures for current operation are also considered. In 1923 capital expenditures were slightly over a billion dollars, and year by year, except for a bulge in 1926, they decreased until they ran just over two-thirds of a billion in 1928. The figures are by no means a direct measure of the amount of steel absorbed. To make steel tonnage the best way for railroads to spend money is in freight cars and locomotives. Rails are another way, but the rail purchases are chiefly for replacement. There is some capital expenditure in them, however, for increased weight is carefully charged to capital. Thus, in 1928 the rail expenditures charged to maintenance amounted to $92,181,000, while in addition there was charged to capital $47,192,000 for "heavier rail," this being 69 per cent more than the amount so charged five years earlier.

From 1923 to 1928 there was a decrease of $382,484,000 in total capital expenditures, but for locomotives and freight cars the decrease was $450,581,000; i.e., capital expenditures for all other purposes actually increased by $68,097,000, which is 15 per cent of such expenditures in 1923.

In six years there has been a large turnover in locomotives and freight cars, installations slightly exceeding retirements in the case of freight cars but falling far short in the case of locomotives. The pamphlet mentioned gives tables of equipment installed and retired by years, 1923 to 1928 inclusive. During this period both locomotives and freight cars rapidly decreased, 1928 compared with 1923 showing only 31 per cent as many locomotives and 24 per cent as many freight cars installed. Locomotive retirements were relatively constant, while freight car retirements greatly decreased. The sum totals for the six years show 13,560 locomotives installed and 18,562 retired; 749,116 freight cars installed and 747,915 retired.

By referring to statistics of equipment in service Dec. 31, 1922, the turnover in the following six years may be computed. Relative to number in service at that date, the locomotive installations were 21 per cent and the retirements 29 per cent, while the freight car installations and retirements both figure out ap-

proximately 32 per cent. Thereby the railroads must have worked their equipment into pretty good shape.

The relative consumption of steel by the railroad and automotive industries is interesting. It is a curious coincidence that, according to the annual findings of THE IRON AGE, the combined percentages were precisely the same for four years, 1923 to 1926 inclusive, whereupon there was a drop. The percentages of total steel were as follows:

	Railroad	Automotive	Total
1923.....	27	11	38
1924.....	28	10	38
1925.....	25	13	38
1926.....	23½	14½	38
1927.....	19	14	33
1928.....	16	18	34

At the middle of a year a forecast of railroad absorption of steel for the entire year would be largely conjectural. Substantially this would be true of the automotive industry, particularly as we do not know what the year's total steel production will be. It is possible to apply factors of usual seasonal variation, however, for both automobiles and steel and such a computation brings out 22 per cent as the 1929 automotive proportion. It would require 16 per cent by the railroads to restore the former 38 per cent for the two, and that seems hardly probable.

Copper Curtailment

A SOMEWHAT contradictory situation has developed in the copper market. Visible stocks, on which good statistics are available, are very low and increased but slightly in May. Large foreign buying is said to be necessary to cover July and August requirements. Some American consumers have been asking for prompt delivery of copper ordered for July. The refinery price has been stationary at 17¾c. for about three months. Yet with supplies small, demand large, and a market price yielding excellent returns, one of the leading producers has curtailed mine output 25 per cent.

Several reasons for such a move could be given. Officials of that mining company may believe that the large demand from copper and brass fabricators during the last six months represents a peak in the latter's business, and that normal consumption can be adequately supplied by a less-than-capacity operation at the mines. Such a view may be correct, since the producer that has curtailed is highly integrated, and the mine production could well be governed by the condition of the order books of the brass-making subsidiary.

On the other hand, it might be argued that curtailment is primarily in the interest of stabilization. Actual sales of copper have been in small volume for some weeks; the price has been regulated by the necessity of custom smelters to sell a relatively small tonnage. What is to be the price of copper when consumers come seriously into the market, when they have used up all the high-priced metal they scrambled to buy during the first quarter? While the law of supply and demand has been often amended or nullified, it remains true that if a necessity is scarce it commands a high price. On the other hand, if plenty of copper is available, consumers are likely to get it cheaper.

As a matter of fact an ordinary producer of copper could make nearly the same profit at 75 per cent operation, if thereby the price could be maintained at the present level, as at full capacity operation with the price a cent lower.

To Lift Europe by Lifting Wages

BY raising the standard of wages in European countries, Henry Ford believes that some measure of the prosperity which the United States is enjoying can be brought to the manufacturing nations abroad. Mr. Ford has persuaded the Twentieth Century Fund to donate $25,000 to the International Labor Office of the League of Nations to secure data on employment conditions in Europe, upon which the Ford Motor Co. can equalize real wages in its plants in all countries.

That "America's prosperity is largely due to the unprecedented increase in the purchasing power of the people," is the statement of the president of the fund, Edward A. Filene of Boston, in making the announcement of the $25,000 donation. He goes on to say that "the same policies that produce prosperity in the United States will produce prosperity in France or Germany or England or any other nation."

Although not a few American manufacturers were skeptical of the wisdom of the high minimum daily wage when it was first established in the Ford plants in this country, the opinion is now widely held that well-paid labor has contributed a large part to our present prosperity. Mr. Schwab, in his presidential address to the American Iron and Steel Institute at its May meeting, said: "All of us have come to recognize the great economic importance of maintaining a high wage scale."

Just as the prosperity of every man's neighbors in our own country helps both his and the general prosperity, the Twentieth Century Fund believes that increased prosperity in European countries will help us in the sense that "prosperous neighbors fill each other's pocketbooks" and that "any increase in the purchasing power of the masses of the people in any nation will be of inestimable benefit, not only to that nation, but also to the world at large."

Right Handling of Technical Sessions

WHO that has served any considerable term in attending engineering society meetings has not learned that what the chairman does or fails to do goes far toward making a session a success or a failure? The program may be outfitted with prominent names; the session subject may be of high timeliness, and moot enough to sharpen interest and loosen tongues; but unless there be animated and well-directed leadership from the chair, the outcome, in free and worth-while discussion, will be lamentably small.

The custom of bestowing session chairmanships on past officers or on men who have earned prominence by laboratory work or contributions to literature is entirely understandable. But it may be suggested that doing honor to one who has worthily achieved in his special field should not be the first consideration in making such selections. "Professor Brown," leading

research chemist, may very naturally be thought of to preside over a session on nitriding, but if he lacks that "gift of people" which would draw out expression from the right men at the right juncture this long-time custom might better be honored in the breach than in the observance.

The late Dr. Charles B. Dudley, who for seven years presided over the meetings of the American Society for Testing Materials, was a master of the art of drawing out discussion. None who attended the Atlantic City meetings of 20 to 25 years ago can forget that the charm of his personality, his rich experience and his way of stimulating free expression by those best fitted to speak on the subject in hand made many a session memorable. Makers of programs, in all our engineering societies, may well take a leaf from the Dudley memoir and bring technical discussions to the old-time place of service and distinction.

Studying the Lesser Savings

MANUFACTURING economies do not always fall in the category of higher speed of operation, fewer men for a given task, greater use of mechanical conveyors, less cross-hauling of parts, and maximum use of automatic machinery. Frequently a change that appears insignificant cuts the cost of an important piece and, through much repetition in the production of that part, converts itself into a sizable sum on the right side. It may take the form of an engineering innovation or its bearing may be chiefly commercial. A single case will illustrate the point:

Automobile crankshafts have been forged from round steel bars cut to length and from square billets of equivalent cross-section. It was thought in the engineering department of one plant that the round bars were necessary for best results. But tests showed this was not the case. Hence the practice changed to the use of square billets, for two reasons: They were a bit cheaper to buy; they were considerably less costly in freight charges, as they took the rate for semi-finished steel. An added advantage was that they overcame the tendency occasionally noticed with the rounds, of piling up in their progress down the gentle slope of the heating furnace hearth.

Here the commercial factor, reduced cost of delivered raw stock, and the practical or engineering consideration of less trouble in heating combined to suggest a change in shape. Not always is the advisability of a departure so clearly indicated. More frequently, perhaps, it is a case of striking a balance between prospective advantages from one source and disadvantages likely to result from some other condition involved in the proposed practice.

CORRESPONDENCE

Resistance of Steel Pipe to Soil Corrosion

To the Editor:—The article entitled "Pipe Steel Resists Corrosion Poorly" (page 1569, THE IRON AGE, June 6), gives me the impression of overemphasizing the tendency of steel pipe to corrode compared with other kinds of ferrous metals, in spite of the brief abstract from a paper by the writer which is placed at the end of your article. A prominent steel casting manufacturer wrote me in regard to this abstract, thinking that it was striking at his product, which is made to resist wear. Apparently he did not get the idea that the remarks credited to the writer were made solely with reference to the corrosion of ferrous metals. A brief abstract without an explanatory note is likely to be misunderstood.

One inference from the article is that steel should not be used by itself to resist corrosion. As a matter of fact, 90 per cent of the steel oil and gas mains are laid without any protection. The Bureau of Standards soil tests to which you refer indicate that cast iron is penetrated at least as deeply as steel where the soil is corrosive. Cast iron, however, is not mentioned in your article.

Another interesting fact not brought out by these tests is that the rate of corrosion varies about 30 to 1 in different soils, whereas the difference between the average rate of corrosion of different classes of ferrous metals is only about 12 per cent, which does not include cast iron.

I would also take exception to the remark that "Pitting under a good protective coating has been noted on pipe which had not properly been de-scaled and dried." This may have been true in certain specific cases, but it is still a question among engineers as to whether it pays to de-scale pipe before coating. The moisture in these cases probably came from the soil after the pipe was laid. Experiences show that all such action can be prevented by closer attention to the character of the coating.

The data given to support the theory that 0.22 per cent carbon steel is less susceptible to corrosion than 0.08 per cent carbon steel include tests of a few weeks' duration in solutions approximating some ground waters. Much more extensive data exist to disprove the effect of carbon under these conditions. In any case such tests do not include contact with the soil and are therefore not relevant to the case. This and the de-scaling discussion are obviously exploiting the contentions of the company mentioned in connection with this article. The discussion of this article at the Bureau of Standards meeting tended to clear up some of the points referred to above. About 35 papers on the subject of soil corrosion were presented at this conference, which was of a rather private nature.

F. N. SPELLER,
Director Department of Metallurgy and Research, National Tube Co.

Pittsburgh, June 22.

Against Use of Word Only in Advertising

To the Editor: "Not All the People All the Time" sure enough is right. The editorial (June 27, page 1788) should be broadly distributed to every paper in the land, or better pasted up in about 50,000 sales offices in various industries in the country.

Public distrust is one thing, disgust is quite another, and that is present also.

You miss one very highly important point, and that is the use or abuse of the expression only. This is an out and out abuse, and just what the moral and the legal situation is I have never seen expressed.

I refer to such expressions: Electric ice box, only $240; vacuum cleaner, only $75; radio, only $175, or only $25 down and only $10 a month; auto, only your old car down, and $40 a month.

The situation in this good old U. S. A. is not vastly different from what it was some years ago. The average income of the average individual is not better than $1,200 per year, or $100 per month, and that is just ahead of starvation, and I should think that seeing on all sides that word only would drive thousands mad.

SIDNEY CORNELL,
Professional engineer.

New York.

Steel Founders Plan Broader Association

Following Summer Studies Will Formulate Definite Objectives in Fall Meeting

WITH plans for an expansion in association activity, executives of steel foundries met at White Sulphur Springs, W. Va., June 27 and 28. What is in mind is a much larger organization than now represented in the Steel Founders' Society of America and possibly such additional services to the industry as studies in trade development. Granville P. Rogers has been engaged as managing director of the society, with headquarters at 932 Graybar Building, New York, and in the next two or three months Mr. Rogers is to make an intensive investigation of the steel foundry's commercial and economic problems. A meeting of the society is then likely to be held in September with the presentation of definite objectives. Meanwhile an effort will be made to increase the membership two or three times the 48 foundries now enrolled and regularly reporting on the state of bookings, operations and shipments.

The sessions at White Sulphur were largely informal, the one stated address being made by Homer J. Buckley, president, Buckley, Dement & Co., Chicago, advertising specialists, who devoted himself to what he emphasized as creative salesmanship. He touched on the place of the association in meeting the big problem of the economics of distribution, pointing out that three objectives of an association, the getting of new members, expanding production and securing better prices, are virtually all solved if widened use of products is achieved.

A. H. Jamieson, Malleable Iron Fittings Co., Brantford, Conn., reported on the action of the American Society for Testing Materials in respect to a standard for valves, fittings, flanges and the like for high temperature service. That society would take no account of steel made by the converter process but allows alone for the open-hearth and electric furnace processes, as a result of the force of the contentions of the buyers of such products that the steel must meet highly specialized service. The consensus of opinion was that the steel castings society needs to take an active part in the negotiations over standards to see that nothing intentionally unfair is allowed to be written in the testing society's specifications but to be awake to the fact that such specifications are commonly influenced by engineers of consumers without the full checks of the knowledge of the producers. That the situation is a practical one was brought out in the announcement of plans of the testing society to draw up a standard for alloy steel castings.

Reports from 48 members having a monthly capacity of 38,000 tons showed that May operations averaged 92 per cent.

Shipments in May were at a rate of 93½ per cent of capacity. Bookings for June, according to preliminary estimates, appeared to be at about an 86½ per cent rate.

The officers of the society are: President, J. E. McCauley, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.; vice-presidents, W. H. Worrilow, Lebanon Steel Foundry, Lebanon, Pa., and A. Simonson, Falk Corporation, Milwaukee; treasurer, G. H. Friesel, United Engineering & Foundry Co., Pittsburgh.

Members of executive committee, J. P. Allen, Union Steel Casting Co., Pittsburgh; H. E. Field, Wheeling Mold & Foundry Co., Wheeling, W. Va.; J. E. Galvin, Ohio Steel Foundry Co., Lima, Ohio; H. J. Koch, Fort Pitt Steel Casting Co., McKeesport, Pa.; J. T. Osler, Hubbard Steel Foundry Co., East Chicago, Ind.; S. W. Utley, Detroit Steel Casting Co., Detroit; and H. F. Wahr, Mesta Machine Co., Pittsburgh.

June Automobile Production Heavy

Chevrolet Sets New Record for One Month's Production—Seasonal Decline Is Unusually Slow

DETROIT, July 2.—Despite the fact that the peak of activity in the automobile industry has passed, several production records were established by manufacturers during the past month. The seasonal decline in output this year has been unusually slow, and only one company, which has made public its figures for June, showed a decrease in shipments compared with the same month of 1928.

The Chevrolet Motor Co. set a new record for one month's production by turning out 151,297 units. This is nearly 20,000 more than the 132,800 units built in June, 1928. For the first half of 1928 the company manufactured 845,469 six-cylinder cars, the largest production ever reported by a company making six-cylinder models. This is a substantial gain in number of units compared with the 751,542 four-cylinder cars produced by Chevrolet in the first six months of last year. W. S. Knudsen, president, predicts that total output for 1929 will reach 1,250,000 units.

The Oldsmobile division of General Motors shipped 67,389 units in the first half of 1929, compared with 50,070 in the same period of 1928. Shipments of Vikings are not included in these figures.

The Buick Motor Co. division of General Motors produced 14,665 cars in June, of which 10,400 were Buicks and 4265 Marquettes. In the previous month total production was about 12,000 cars. The July schedule calls for 31,408 cars, consisting of 23,408 Buicks and 8000 Marquettes.

Shipments of the Hudson Motor Car Co. in the first half of the year amounted to 226,318 units, including Hudson and Essex cars. This is the highest production for a six months' period in the company's history. June shipments were 31,137 cars.

The Reo Motor Car Co. shipped 3042 cars and trucks during June, compared with 6132 units in June, 1928, and 4453 units in May, 1929. For the first six months of 1929 shipments aggregated 23,127 units, compared with 26,031 units in the same months last year.

Shipments of 1405 cars were made in June by the H. H. Franklin Mfg. Co. This is a gain of 74 per cent over June, 1928. For the first six months shipments totaled 8719, a new record and an increase of 135 per cent over the similar period of 1928.

The Auburn Automobile Co. reports June shipments of 3144 cars, a new monthly record and a gain of 124 per cent over June, 1928.

The Packard Motor Car Co. produced 46,702 cars in the 10 months ended June 30, compared with 41,131 cars in the corresponding period of the previous fiscal year.

Durant cars shipped to Canada during the first five months of 1929 showed an almost 100 per cent increase over the same period of 1928. In that period Durant Motors of Canada, Ltd., earned $1.19 a share, compared with $1.02 a share in the same period last year.

Cooperative School Students Graduated

Bristol, Conn., has just graduated the first students in its cooperative industrial school, founded in 1925. During the first year of their schooling the boys spent part, and during the last three years and during vacation periods, much of their time in manufacturing plants securing practical experience. They completed 6750 shop hours, received 20 to 30c. an hour and earned during the course approximately $1,660 each.

Connecticut companies giving financial and practical support to the school are the Wallace Barnes Co., American Silver Co., E. Ingraham Co., New Departure Mfg. Co., and Veeder-Root, Inc.

Carboloy Co., Inc., 350 Madison Avenue, New York, has opened a New England sales office at Bridgeport, Conn., with H. R. Hayter, 515 City National Bank Building, in charge.

New June Record in Iron Output

Daily Rate Less Than May by 2490 Tons or 2 Per Cent—New Six Months' Record—Net Loss of One Furnace

NEW records for June were made in pig iron last month. The production was not only the largest for that month ever recorded but a new high in totals for six months was registered. The May record still stands at the top.

Telegraphic reports on July 2, with only one furnace estimated, show that the June pig iron output was 3,697,628 gross tons, or 123,255 tons per day for the 30 days. This is a loss of 2490 tons or about 2 per cent from the 125,745 tons per day for the 31 days in May. The best previous June record was 3,676,445 tons or 122,548 tons per day in 1923.

A New Six Months' Record

For the six months to July 1, the production was 21,621,363 tons. The best previous half year was 20,841,534 tons to July 1, 1923, so that this year's output is 3.75 per cent in excess of the 1923 total. In 1918, the third largest six months, the total was 20,503,477 tons to July 1. No other six months ever reached 20,000,000 tons nor did any six months' period ever attain these heights.

Operating Rate on July 1

On July 1 there were 218 furnaces active, having an estimated daily operating rate of 121,945 tons. This contrasts with 126,150 tons per day for the 219 furnaces active on June 1. There has been a decided slacking in operating rate for the larger furnaces during the month which accounts largely for the considerably lower operating rate with only one

Daily Average Production of Coke Pig Iron in the United States by Months Since Jan. 1, 1925—Gross Tons

	1925	1926	1927	1928	1929
Jan.	108,720	106,974	100,123	92,573	111,044
Feb.	114,791	104,408	105,024	100,004	114,507
Mar.	114,975	111,032	112,366	103,215	119,822
Apr.	108,632	115,004	114,074	106,183	122,087
May	94,542	112,304	109,385	105,931	125,745
June	89,115	107,844	102,988	102,733	123,255
½ year	105,039	109,660	107,351	101,763	.....
July	85,936	103,978	95,199	99,091	.....
Aug.	87,241	103,241	95,073	101,180	.....
Sept.	90,873	104,543	92,498	102,077	.....
Oct.	97,528	107,553	89,810	108,832	.....
Nov.	100,767	107,890	88,279	110,084	.....
Dec.	104,853	99,712	86,960	108,705	.....
Year	99,735	107,043	99,266	103,382	.....

Pig Iron Production by Districts, Gross Tons

	June (30 days)	May (31 days)	April (30 days)	March (31 days)
New York and Mass.	246,124	265,512	257,299	259,771
Lehigh Valley	102,302	108,803	93,506	96,978
Schuylkill Valley	70,265	74,312	69,684	71,002
Lower Susq. and Lebanon Valleys	44,651	33,392	31,150	34,490
Pittsburgh district	787,313	814,944	780,896	779,013
Shenango Valley	148,675	157,952	143,260	134,854
Western Pennsylvania	126,978	159,960	152,942	153,483
Maryland, Va. and Ky.	114,416	135,073	118,785	110,748
Wheeling district	133,450	147,933	142,470	146,546
Mahoning Valley	371,607	380,129	364,373	372,329
Central and North'n Ohio	374,138	388,958	318,678	326,677
Southern Ohio	46,345	47,635	44,139	47,600
Illinois and Indiana	771,295	795,902	768,307	790,784
Mich., Minn., Mo., Wis., Colo. and Utah	131,462	145,840	135,191	134,987
Alabama	219,218	235,117	235,787	249,079
Tennessee	9,389	6,620	6,158	6,132
Total	3,697,628	3,898,082	3,662,625	3,714,473

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel Works Iron	Merchant Iron*	Total
June, 1928	81,630	21,103	102,733
July	79,513	19,578	99,091
August	82,642	18,538	101,180
September	82,590	19,487	102,077
October	88,051	20,781	108,832
November	88,474	21,610	110,084
December	85,415	23,290	108,705
January, 1929	85,530	25,514	111,044
February	89,246	25,261	114,507
March	95,461	24,361	119,822
April	95,680	26,407	122,087
May	100,174	25,571	125,745
June, 1929	99,813	23,442	123,255

*Includes pig iron made for the market by steel companies.

Coke Furnaces in Blast

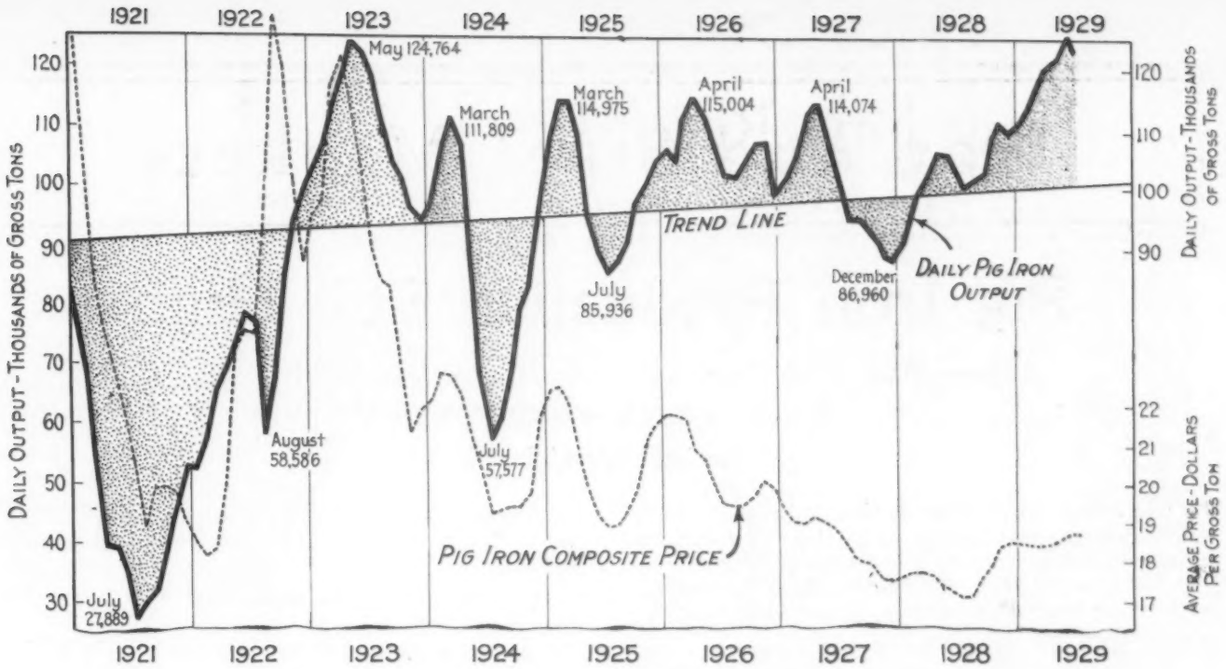
Furnaces	July 1 Number in Blast	July 1 Gross Tons per Day	June 1 Number in Blast	June 1 Gross Tons per Day
New York:				
Buffalo	14	7,275	14	7,455
Other N. Y. and Mass.	3	930	3	1,110
New Jersey	0	....	0	....
Pennsylvania:				
Lehigh Valley	8	3,410*	8	3,510*
Schuylkill Valley	5	2,340	5	2,400
Susquehanna Valley	3	1,495	2	1,075
Ferromanganese	0	....	0	....
Lebanon Valley	0	....	0	....
Ferromanganese	0	....	0	....
Pittsburgh District	40	25,575	40	25,860
Ferromanganese	3	470	2	325
Shenango Valley	9	4,955	9	5,095
Western Pennsylvania	8	3,680	9	4,750
Ferromanganese	3	550	2	410
Maryland	6	3,075	6	3,580
Wheeling District	7	4,290	8	4,770
Ohio:				
Mahoning Valley	19	12,030	20	12,600
Central and Northern	20	12,470	20	12,545
Southern	3	1,545	3	1,530
Illinois and Indiana	35	25,105	36	25,675
Mich., Wis. and Minn.	7	3,160	7	3,470
Colo., Mo. and Utah	3	1,225	3	1,230
The South:				
Virginia	0	....	0	....
Ferromanganese	1	90	1	95
Kentucky	2	650	2	730
Alabama	17	7,310	17	7,585
Ferromanganese	0	....	0	....
Tennessee	2	315	2	350
Total	218	121,945	219	126,150

*Includes spiegeleisen.

Production of Coke Pig Iron in United States by Months Beginning Jan. 1, 1927—Gross Tons

	1927	1928	1929
Jan.	3,103,820	2,869,761	3,442,370
Feb.	2,940,679	2,900,126	3,206,185
Mar.	3,483,362	3,199,674	3,714,473
Apr.	3,422,226	3,185,504	3,662,625
May	3,390,910	3,283,856	3,898,082
June	3,089,651	3,082,000	3,697,628
½ year	19,430,678	18,520,921	21,621,363
July	2,951,160	3,071,824	.....
Aug.	2,947,276	3,136,570	.....
Sept.	2,774,949	3,062,314	.....
Oct.	2,784,112	3,373,806	.....
Nov.	2,648,376	3,302,523	.....
Dec.	2,695,755	3,369,846	.....
Year*	36,232,306	37,837,804	.....

*These totals do not include charcoal pig iron. The 1928 production of this iron was 142,960 gross tons.



Production of Pig Iron in June Represented an Average Output per Furnace Close to 565 Tons

Inclined line represents the gradually increasing theoretical needs of the country, ascertained by a balancing of the ups and downs in production. It shows an average yearly increase in consumption of about 423,000 tons

less furnace. Three furnaces were blown in and four were blown out during June.

The Steel Corporation blew in one and shut down two furnaces as did also the independent steel companies. One merchant furnace was blown in, the net loss being one steel making stack.

Steel-Making Iron Output Still Large

Production of steel-making iron in June was 99,813 tons per day, the second largest on record. In May the 100,174 tons per day was the record. Merchant iron output fell off sharply in June or 23,442 tons compared with 25,571 tons per day in May.

Very Large Ferromanganese Output

Ferromanganese output at 33,363 tons in June is the largest in over 30 months. In July 1928, the 32,909 tons was the best previous recent record. Seven furnaces are now making this alloy. Only two are producing spiegeleisen.

Furnaces Blown In and Out

Among the furnaces blown in during June were one furnace at the Steelton plant of the Bethlehem Steel Corporation in the Susquehanna Valley, one Duquesne furnace of the Carnegie Steel Co. and the Neville Island furnace of the Davison Coke & Iron Co. in the Pittsburgh district. The four furnaces shut down were one Duquesne furnace of the Carnegie Steel Co. in the Pittsburgh district, one Ohio furnace of the Carnegie Steel Co. in the Mahoning Valley, the Martin's Ferry furnace of the Wheeling Steel Corporation in the Wheeling district and one Iroquois furnace of the Youngstown Sheet & Tube Co. in the Chicago district.

Possibly Active Stacks Reduced

The Thomas furnace of the Milwaukee Blast Furnace Co., Chicago, has been scrapped. Thus the number of possibly active stacks in the United States has been reduced from 319 to 318.

Production of Steel Companies for Own Use—Gross Tons

	Total Pig Iron Spiegel and Ferromanganese			Ferromanganese*		
	1927	1928	1929	1927	1928	1929
Jan.	2,343,881	2,155,133	2,651,416	31,844	22,298	28,208
Feb.	2,256,651	2,274,880	2,498,901	24,560	19,320	25,978
Mar.	2,675,417	2,588,158	2,959,295	27,834	27,912	24,978
Apr.	2,637,919	2,555,500	2,826,028	24,735	18,405	22,413
May	2,619,078	2,652,872	3,105,404	28,734	29,940	25,896
June	2,343,409	2,448,905	2,951,168	29,232	32,088	33,363
½ year	14,876,355	14,675,448	16,992,612	166,939	149,963	160,836
July	2,163,101	2,464,896	.....	26,394	32,909	.....
Aug.	2,213,815	2,561,904	.....	21,279	24,583	.....
Sept.	2,090,200	2,477,695	.....	20,675	22,278	.....
Oct.	2,076,722	2,729,589	.....	17,710	23,939	.....
Nov.	1,938,043	2,654,211	.....	17,851	29,773	.....
Dec.	1,987,652	2,647,863	.....	20,992	28,618	.....
Year	27,345,888	30,211,606	.....	291,840	312,061	.....

*Includes output of merchant furnaces.

Unloading Capacity of 3600 Tons an Hour

Three 17-ton electric unloaders recently purchased from Wellman-Seaver-Morgan Co., Cleveland, for the new docks of the Hocking Valley Railroad Co., at Toledo, Ohio, will have hourly capacity for handling 1200 tons each. The trolley with its bucket will be designed for one trip in 50 sec. with a 17-ton load. The travel speed will be from 75 to 100 ft. a minute. The unloaders will operate on tracks spaced 72 ft. 6 in. apart, each track consisting of a pair of rails on 24-in. centers with the forward track center 5 ft. 6 in. from the face of the dock.

These unloaders are designed to excavate from the ore-carrying boats and to load into railroad cars standing on any of the four tracks inside of the span or to stock under a cantilever beyond the rear leg, through disk hoppers and traveling scale larry cars.

Iron and Steel Markets

Pig Iron Production Still High

June Daily Rate Second Only to May Average—July Steel Output to Be Heavy—100,000 Tons for Pipe Line Placed

THE rate of pig iron production in June, at 123,255 tons a day, was the second highest for any month on record, being exceeded only by the daily average of 125,745 tons for May. The decline from the previous month was less than 2 per cent, according to blast furnace returns to THE IRON AGE.

Most of the loss was in merchant pig iron, the recession in the output of steel-making iron having been only 361 tons a day. This showing is not surprising in view of the reduced operations of such large users of merchant iron as the cast iron pipe plants, the makers of radiators and heating equipment and producers of sanitary ware, in contrast with the well-sustained activity of the steel mills.

Throughout June steel ingot output was at close to capacity and variations in operations were due chiefly to the physical limitations of equipment, making weekly percentage estimates of production futile. While accurate statistics for June will not be available until the American Iron and Steel Institute publishes its monthly report, it can safely be said that ingot output in the first half of 1929 approximated 29,000,000 tons, establishing a new six months' record by a margin of nearly 16 per cent over the last half of 1928.

Steel output in the first week of July will be adversely affected by the holiday, with some mills scheduled to shut down from Wednesday night until the end of the week. Advantage will be taken of this interruption to make greatly needed repairs. The outlook for the rest of July is excellent; in fact, a leading steel producer looks for no appreciable change in the operating rate for the next two months. Fluctuations in the output of different kinds of finished products have thus far tended to neutralize one another, leaving the demand for crude steel substantially unchanged.

Mills catering to the automobile industry continue to reduce their backlogs, but unfilled orders for the industry as a whole have held up exceptionally well. Although the Steel Corporation is expected to report a reduction in its unfilled tonnage as of June 30, the decline will probably be small.

The mid-summer falling off in the steel requirements of the motor car builders has been rendered less severe than usual by the sustained operations of makers of low-priced automobiles. The July schedule of the Ford company calls for the manufacture of 190,000 cars.

Rail mills, as a result of supplementary orders, will maintain present operations through July and August instead of undergoing the customary seasonal curtailment. The Norfolk & Western has distributed orders, subject only to formal confirmation, for 39,000 tons of rails. The Pennsylvania has exercised options on 20,000 tons.

Pipe lines are again conspicuous for their contribution to mill commitments. The National Tube Co. and the A. O. Smith Corporation share equally in 100,000 tons of steel for a 22-in. gas line connecting Birmingham with Atlanta. A projected line from Texas to Omaha has been revived, with the probability that it will be placed soon. A 1000-mile gas line is in prospect and the laying of lines to the populous centers along the Eastern seaboard is now receiving serious consideration.

Structural steel awards, at 42,000 tons, were in fair volume, and the large total of pending work was augmented by 37,000 tons.

The buoyancy of steel demand in the face of seasonal influences is particularly notable at Chicago, where specifications again equal shipments and sales for the week were the fifth largest this year.

Prices of semi-finished steel are not yet well defined. The extension of contracts at second quarter prices and the fact that little third quarter business has yet been closed raise doubt in the minds of buyers as to whether advances can be maintained, although some mills are taking a firm stand at $35 for billets and slabs.

Pig iron shipments are being suspended in some instances by automotive foundries, but June deliveries of merchant iron in the Central West declined only about 10 per cent from those of May and shipping orders have shown no further reduction in the first week of July. Western furnaces have a substantial backlog of third quarter business, as a result of steady buying over a number of weeks rather than a concentration of contracting. In other districts melters are still slow in acting on their requirements for the quarter, both on account of a carryover of tonnage and uncertainty as to price.

Total pig iron production for June, at 3,697,628 tons, showed a decline from May's 3,898,082 tons, but was the largest for any 30-day month. Output for the first half of the year, at 21,621,363 tons, established a new six months' peak, exceeding the previous record, made in the first half of 1923, by 3.75 per cent. Furnaces in blast July 1 numbered 218, a net loss of one compared with June 1.

Both of THE IRON AGE composite prices are unchanged. Pig iron is $18.63 a gross ton for the fourth week and finished steel stands at 2.412c. a lb., from which it has not deviated since April 1.

A Comparison of Prices

Market Prices at Date, and One Week, One Month and One Year Previous, Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron, Per Gross Ton:	July 2, 1929	June 25, 1929	June 4, 1929	July 2, 1928
No. 2 foundry, Philadelphia	$21.76	$21.76	$21.76	$20.76
No. 2, Valley furnace	18.50	18.50	18.50	16.75
No. 2 Southern, Cin'ti	18.69	18.69	18.69	19.19
No. 2, Birmingham	15.00	15.00	15.00	15.50
No. 2 foundry, Chicago*	20.00	20.00	20.00	18.00
Basic, del'd eastern Pa	20.25	20.25	20.25	19.00
Basic, Valley furnace	18.50	18.50	18.50	16.00
Valley Bessemer, del'd P'gh	20.76	20.76	20.76	18.76
Malleable, Chicago*	20.00	20.00	20.00	18.00
Malleable, Valley	19.00	19.00	19.00	17.00
Gray forge, Pittsburgh	19.76	19.76	19.76	18.01
L. S. charcoal, Chicago	27.04	27.04	27.04	27.04
Ferromanganese, furnace	105.00	105.00	105.00	105.00
Rails, Billets, Etc., Per Gross Ton:				
Rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	36.00	36.00	36.00	36.00
Rerolling billets, Pittsburgh	**35.00**	34.00	36.00	32.00
Sheet bars, Pitsburgh	35.00	35.00	36.00	32.00
Slabs, Pittsburgh	35.00	35.00	36.00	32.00
Forging billets, Pittsburgh	**40.00**	39.00	41.00	38.00
Wire rods, Pittsburgh	42.00	42.00	42.00	42.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb	1.85	1.85	1.85	1.85
Finished Steel, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.95	1.95	1.95	1.85
Bars, Chicago	2.05	2.05	2.05	2.00
Bars, Cleveland	1.95	1.95	1.95	1.85
Bars, New York	2.29	2.29	2.29	2.19
Tank plates, Pittsburgh	1.95	1.95	1.95	1.85
Tank plates, Chicago	2.05	2.05	2.05	2.00
Tank plates, New York	2.22½	2.22½	2.22½	2.17½
Structural shapes, Pittsburgh	1.95	1.95	1.95	1.85
Structural shapes, Chicago	2.05	2.05	2.05	2.00
Structural shapes, New York	2.19½	2.19½	2.19½	2.14½
Cold-finished bars, Pittsburgh	2.30	2.30	2.30	2.10
Hot-rolled strips, Pittsburgh	1.90	1.90	1.90	1.75
Cold-rolled strips, Pittsburgh	2.75	2.75	2.75	3.00

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Finished Steel, *Per Lb. to Large Buyers:*	July 2, 1929 Cents	June 25, 1929 Cents	June 4, 1929 Cents	July 2, 1928 Cents
Sheets, black, No. 24, P'gh	2.85	2.85	2.85	2.65
Sheets, black, No. 24, Chicago dist. mill	3.05	3.05	3.05	2.75
Sheets, galv., No. 24, P'gh	3.60	3.60	3.60	3.50
Sheets, galv., No. 24, Chicago dist. mill	3.80	3.80	3.80	3.60
Sheets, blue, No. 13, P'gh	2.35	2.35	2.35	2.10
Sheets, blue, No. 13, Chicago dist. mill	2.45	2.45	2.45	2.20
Wire nails, Pittsburgh	2.65	2.65	2.65	2.55
Wire nails, Chicago dist. mill	2.70	2.70	2.70	2.60
Plain wire, Pittsburgh	2.50	2.50	2.50	2.50
Plain wire, Chicago dist. mill	2.55	2.55	2.55	2.55
Barbed wire, galv., Pittsburgh	3.30	3.30	3.30	3.35
Barbed wire, galv., Chicago dist. mill	3.35	3.35	3.35	3.40
Tin plate, 100 lb. box, P'gh	$5.35	$5.35	$5.35	$5.25
Old Material, Per Gross Ton:				
Heavy melting steel, P'gh	$18.25	$18.25	$18.25	$14.00
Heavy melting steel, Phila	**16.50**	16.00	16.00	13.00
Heavy melting steel, Ch'go	14.75	14.75	15.00	12.25
Carwheels, Chicago	14.00	14.00	14.50	13.00
Carwheels, Philadelphia	16.00	16.00	16.00	15.50
No. 1 cast, Pittsburgh	15.50	15.50	15.00	14.25
No. 1 cast, Philadelphia	16.50	16.50	16.50	15.50
No. 1 cast, Ch'go (net ton)	14.50	14.50	15.00	13.50
No. 1 RR. wrot., Phila	16.00	16.00	16.00	13.50
No. 1 RR. wrot., Ch'go (net)	13.50	13.50	14.00	11.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$2.75	$2.75	$2.75	$2.60
Foundry coke, prompt	3.75	3.75	3.75	3.75
Metals, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Lake copper, New York	18.12½	18.12½	18.12½	14.87½
Electrolytic copper, refinery	17.75	17.75	17.75	14.50
Tin (Straits), New York	**44.62½**	44.25	43.62½	46.12½
Zinc, East St. Louis	6.70	6.70	6.55	6.20
Zinc, New York	7.05	7.05	6.90	6.55
Lead, St. Louis	6.80	6.80	6.80	6.15
Lead, New York	7.00	7.00	7.00	6.30
Antimony (Asiatic), N. Y.	8.75	8.75	8.87½	9.62½

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

Completing a Record Half Year, the Steel Industry Faces a Summer of Unusual Activity

PITTSBURGH, July 2.—With many records achieved, the steel industry has completed what has apparently been the most prosperous six months in its history and now faces a summer of considerable activity. In the Pittsburgh and tributary districts, June seems to have established a number of records for that month, notably in ingot production, shipments of flat-rolled products and probably in the production of pig iron. But this was accomplished in the face of a gradual decline in the demand for steel and may have been the result of a carryover of the high momentum of the earlier months of the year rather than an extraordinary current demand.

The gradual decline in specifications for some products was checked slightly last week, but this was more likely due to the clearing up of old contracts rather than to a general acceleration in demand. With fairly comfortable backlogs, mills are not yet unduly anxious for business, but another month will find their position somewhat changed, even though the summer decline in specifications does not reach marked proportions.

At present, operations of open-hearth furnaces are still at close to physical capacity, but a marked curtailment is scheduled this week on account of the holiday. Mills are taking advantage of the interruption to make greatly needed repairs to their equipment, and most of the sheet and tin mills in this and nearby districts will be closed down Wednesday night for the remainder of the week.

July promises to be a good month in production. Sheet orders now on company books are sufficient for more than a month's operations, and the same thing is true of plates. On other products delivery promises range from two to four weeks, and in many cases shipments have been just about equal to specifications, allowing little opportunity for improving deliveries.

Efforts of sellers of semi-finished steel to get higher prices for their products than were received in the second quarter on contract business are meeting with indifferent success. Users generally have enough steel on hand or remaining on old contracts to last for several weeks and are not anxious to assume future obligations at higher prices.

On certain finished products, notably galvanized sheets, structural shapes and cold-rolled strip, price irregularities have developed. Except in the case of galvanized sheets, this tendency is not sufficiently extended to make the market quotably lower.

Dullness still prevails in the pig iron and scrap market. Third quarter buying in pig iron still lags, although the week before last brought out some sizable inquiries, some of which are still outstanding. No. 1 heavy melting steel is still quotable at $18 to $18.50, and sales of compressed sheets in the last week have established this grade at the same level.

Pig Iron—Sales are confined largely to small lots, and buyers are hesitant about covering their third quarter requirements. No large inquiries have been reported during the week, although the Westinghouse Electric &

Mfg. Co. has not yet closed against its Trafford City, Pa., tonnage. Consumers are said to have enough iron on contract to carry them into July, but cannot defer their purchases very long after the middle of the month. The foundry melt in this district during June was rather low, the most active users having been the steel foundries, which are busy on railroad business, and steel mill equipment makers. The same situation exists in the Valleys, where non-integrated steel companies are nearly all covered for July and August and where buying by foundries has been negligible. In the face of quiet demand, prices are steady, with small tonnages moving at the full market quotations of $18.50, Valley, for basic and foundry and $19 for malleable and Bessemer. In the immediate Pittsburgh district shading has occurred only on basic iron and on transactions in which details are lacking.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$18.50
Bessemer	19.00
Gray forge	18.00
No. 2 foundry	18.50
No. 3 foundry	18.00
Malleable	19.00
Low phos., copper free	27.00

Freight rate to Pittsburgh or Cleveland district, $1.76.

Prices per gross ton f.o.b. Pittsburgh district furnace:

Basic	$19.00
No. 2 foundry	19.00
No. 3 foundry	18.50
Malleable	19.50

Freight rates to points in Pittsburgh district range from 63c. to $1.13.

Semi-Finished Steel. — The supply of semi-finished steel in this district has not yet become plentiful, and, with production holding close to physical limits, market interest is centered chiefly in prices. The $36 price on sheet bars, billets and slabs, which prevailed for a time on spot purchases, is no longer widely adhered to, although it is still quoted by companies which have little or no steel to spare at this time. Sheet bars are well established at $35, Pittsburgh or Youngstown, the price which prevailed on second quarter business. On billets, slabs and forging billets, the latter ordinarily carrying a $5 premium over rerolling billets, the going prices are not so clearly defined. Billets are obtainable at $35, Pittsburgh or Youngstown, but large consumers are reluctant to pay this price on their third quarter contract tonnage, as it represents an advance of $1 a ton over the second quarter price. Although a sale of slabs was reported to have been made recently in this district at $34, it seems not to have been made by a Pittsburgh or Youngstown producer, and fairly large buyers of billets and slabs in this district have not been able to get this price on their third quarter requirements. As a result, very little tonnage has been closed. Users have enough steel on contract to last them for a month or more, and until contracts are closed the price may not readily be determined. In view of the fact that sellers are nominally quoting $36 and consumers are quite willing to pay $34, the market on billets and slabs is probably most fairly represented at $35, Pittsburgh or Youngstown, a price which has been done on small transactions and which might likely become the ruling quotation if the supply of crude steel does not become more plentiful in the next 30 days.

Bars, Shapes and Plates.—New business improved in the last week of the month. In plates, June was one of the best months the industry has ever experienced. Little or no reduction in backlogs occurred during the month, and plate mills enter the second half of the year with orders sufficient for at least six weeks operations, and no decline in specifications is in view. In bars and shapes, the situation is not so good, shipments during the past month having been generally ahead of specifications. On bars, delivery promises now average about three weeks, with still better shipments possible on shapes. Fabricating shops in the district are fairly well engaged, but business is spotty, leaving plenty of room for small orders which seem to be rather scarce. Fabricated prices are also rather weak and, although this has not been generally reflected in the price of shapes, reports of occasional quotations lower than 1.95c., Pittsburgh, are not lacking. On bars, this price seems to be holding, and the plate quotation is unusually firm. Reinforcing bars are quoted at 2.05c., Pittsburgh, for 40, 50 and 60 ft. lengths, and the price is well maintained in the face of an active demand.

Rails and Track Supplies.—The Norfolk & Western is inquiring for 39,000 tons of rails, and the market is showing additional activity in view of prospective supplementary purchases by the Pennsylvania. June turned out to be a good month in the track supply business, at least from the standpoint of shipments, although specifications declined seasonably.

Wire Products.—Heavy specifications last week occasioned by the end of the quarter made the week one of the best of the year in the wire business. Demand for manufacturers' wire is holding up well in spite of the reported decline in the requirements of the automobile industry, and there is a satisfactory movement of agricultural wire products. Nails are dull, but this condition is generally accepted as permanent, and makers are no longer disappointed by unsatisfactory tonnages. Price weakness is confined to competitive districts, quotations being adhered to in the immediate Pittsburgh territory.

Tubular Goods.—The pipe market is rather quiet, with an unsatisfactory demand for the buttwelded products and little activity just now in the line pipe field. With one possible exception, no large line pipe projects are now before the trade, and oil country business leaves something to be desired. The California fields are requiring very little pipe; reports of improving demand are conflicting. The situation in the Texas and Oklahoma region is somewhat better. Demand for mechanical and boiler tubing is holding up unusually well, and prospects are good for a steady summer demand.

Sheets.—With the best six months in its history behind it, the sheet industry enters the second half of the year with orders sufficient for a month's operations, and schedules in

The Iron Age Composite Prices

Finished Steel

July 2, 1929, 2.412c. a Lb.

One week ago	2.412c.
One month ago	2.412c.
One year ago	2.341c.
10-year pre-war average	1.689c.

Based on steel bars, beams, tank plates, wire, rails, black pipe and black sheets. These products make 87 per cent of the United States output of finished steel.

	High		Low	
1929	2.412c.,	April 2;	2.391c.,	Jan. 8
1928	2.391c.,	Dec. 11;	2.314c.,	Jan. 3
1927	2.453c.,	Jan. 4;	2.293c.,	Oct. 25
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18

Pig Iron

July 2, 1929, $18.63 a Gross Ton

One week ago	$18.63
One month ago	18.71
One year ago	17.25
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1929	$18.71,	May 14;	$18.29,	March 19
1928	18.59,	Nov. 27;	17.04,	July 24
1927	19.71,	Jan. 4;	17.54,	Nov. 1
1926	21.54,	Jan. 5;	19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July 7

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill	1.95c.
F.o.b. Chicago	2.05c. to 2.15c.
Del'd Philadelphia	2.27c.
Del'd New York	2.29c.
Del'd Cleveland	1.95c. to 2.00c.
F.o.b. Cleveland	1.95c.
F.o.b. Lackawanna	2.05c.
F.o.b. Birmingham	2.15c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills, 40, 50, 60-ft.	2.05c.
F.o.b. Pittsburgh mills, cut lengths	2.30c.
F.o.b. Birmingham, mill lengths	2.15c.

Rail Steel

F.o.b. mills, east of Chicago dist.	1.85c. to 1.90c.
F.o.b. Chicago Heights mill	1.95c.
Del'd Philadelphia	2.27c.

Iron

Common iron, f.o.b. Chicago	2.05c. to 2.10c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.12c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill	1.95c.
F.o.b. Chicago	2.05c.
F.o.b. Birmingham	2.15c.
Del'd Cleveland	2.14c.
Del'd Philadelphia	2.15c.
F.o.b. Coatesville	2.05c.
F.o.b. Sparrow Point	2.05c.
F.o.b. Lackawanna	2.05c.
Del'd New York	2.22½c.
C.i.f. Pacific ports	2.35c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill	1.95c.
F.o.b. Chicago	2.05c. to 2.15c.
F.o.b. Birmingham	2.15c.
F.o.b. Lackawanna	2.05c.
F.o.b. Bethlehem	2.05c.
Del'd Cleveland	2.14c.
Del'd Philadelphia	2.01c. to 2.06c.
Del'd New York	2.14½c.
C.i.f. Pacific ports	2.35c.

Hot-Rolled Hoops, Bands and Strips

	Base per Lb.
6 in. and narrower, P'gh	2.00c.
Wider than 6 in., P'gh	1.90c.
6 in. and narrower, Chicago	2.20c.
Wider than 6 in., Chicago	2.10c.
Cooperage stock, P'gh	2.20c.
Cooperage stock, Chicago	2.30c.

Cold-Finished Steel

	Base per Lb.
Bars, f.o.b. Pittsburgh mill	2.30c.
Bars, f.o.b. Chicago	2.30c.
Bars, Cleveland	2.35c.
Shafting, ground, f.o.b. mill	*2.65c. to 3.60c.
Strips, P'gh	2.75c. to 2.85c.
Strips, Cleveland	2.75c. to 2.85c.
Strips, del'd Chicago	3.05c. to 3.15c.
Strips, Worcester	2.90c. to 3.00c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland	4.25c. to 4.35c.

*According to size.

Wire Products

(Carload lots, f.o.b. Pittsburgh and Cleveland, to jobbers and retailers.)

	Base per Keg
Wire nails	$2.65 to $2.75
Galvanized nails	4.65 to 4.75
Galvanized staples	3.35 to 3.45
Polished staples	3.10 to 3.20
Cement coated nails	2.65 to 2.75
	Base per 100 Lb.
Bright plain wire, No. 6 to No. 9 gage	$2.50 to $2.60
Annealed fence wire	2.65 to 2.75
Spring wire	3.50 to 3.60
Galv'd wire, No. 9	3.10 to 3.20
Barbed wire, galv'd	3.30 to 3.40
Barbed wire, painted	3.05 to 3.15
Woven wire fence (per net ton to retailers)	65.00

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass., (wire) mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.

Cut Nails

	Per 100 Lb.
Carloads, Wheeling, Reading or Northumberland, Pa.	$2.70
Less carloads, Wheeling or Reading	2.80

Light Plates

No. 10, blue annealed, f.o.b. P'gh	2.20c.
No. 10, blue annealed, f.o.b. Chicago dist.	2.30c.
No. 10, blue annealed, del'd Phila.	2.42c. to 2.52c.
No. 10, blue annealed, B'ham	2.35c.

Sheets

Blue Annealed

	Base per Lb.
No. 13, f.o.b. P'gh	2.35c.
No. 13, f.o.b. Chicago dist.	2.45c.
No. 13, del'd Philadelphia	2.67c.
No. 13, blue annealed, B'ham	2.50c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	2.85c. to 2.95c.
No. 24, f.o.b. Chicago dist. mill	3.05c.
No. 24, del'd Philadelphia	3.17c. to 3.27c.
No. 24, f.o.b. Birmingham	3.00c. to 3.10c.

Metal Furniture Sheets

No. 24, f.o.b. P'gh	4.10c. to 4.20c.

Galvanized

No. 24, f.o.b. Pittsburgh	3.50c. to 3.70c.
No. 24, f.o.b. Chicago dist. mill	3.80c.
No. 24, del'd Cleveland	3.79c. to 3.89c.
No. 24, del'd Philadelphia	3.92c. to 4.02c.
No. 24, f.o.b. Birmingham	3.75c. to 3.85c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	3.00c.
No. 28, f.o.b. Chicago dist. mill	3.10c.

Automobile Body Sheets

No. 28, f.o.b. Pittsburgh	4.10c.

Long Ternes

No. 24, 8-lb. coating, f.o.b. mill	4.00c.

Vitreous Enameling Stock

No. 24, f.o.b. Pittsburgh	3.90c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.35
Standard cokes, f.o.b. Gary	5.45

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)
(Per Package, 20 x 28 in.)

8-lb. coating I.C. $11.20	25-lb. coating I.C. $16.70
15-lb. coating I.C. 14.00	30-lb. coating I.C. 17.75
20-lb. coating I.C. 15.30	40-lb. coating I.C. 19.85

Alloy Steel Bars

(F.o.b. makers' mill)

Alloy Quality Bar Base, 2.65c. to 2.75c. per Lb.

S.A.E. Series Numbers		Alloy Differential
2000	(1½% Nickel)	0.25
2100	(1½% Nickel)	0.55
2300	(3½% Nickel)	1.50
2500	(5% Nickel)	2.25
3100	Nickel Chromium	0.55
3200	Nickel Chromium	1.35
3300	Nickel Chromium	3.80
3400	Nickel Chromium	3.20
4100	Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100	Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600	Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel)	1.05
5100	Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100	Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100	Chromium Spring Steel	0.20
6100	Chromium Vanadium Bars	1.20
6100	Chromium Vanadium Spring Steel	0.95
9250	Silicon Manganese Spring Steel (flats)	0.25
	Rounds and squares	0.50
	Chromium Nickel Vanadium	1.50
	Carbon Vanadium	0.95

Above prices are for hot rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is ¾c. per lb. higher. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a sectional area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. carry the bar price.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	36.00
Light (from rail steel), f.o.b. mill	34.00
Light (from billets), f.o.b. Ch'go mill	36.00

Track Equipment

	Base per 100 Lb.
Spikes, ⅜ in. and larger	$2.80
Spikes, ⅓ in. and smaller	2.80
Spikes, boat and barge	3.00
Tie plates, steel	2.15
Angle bars	$2.75
Track bolts, to steam railroads	$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	¼ and ⅜	+11	+36
¼ to ⅜	51	25½	½	23	5
½	56	42½	¾	28	11
¾	60	48½	1 and 1¼	31	15
1 to 3	62	50½	1½ and 2	35	18

Lap Weld

2	55	43½	2	23	9
2½ to 6	59	47½	2½ to 3½	28	13
7 and 8	56	43½	4 to 6	30	17
9 and 10	54	42½	7 and 8	29	16
11 and 12	53	40½	9 to 12	26	11

Butt Weld, extra strong, plain ends

⅛	41	24½	¼ and ⅜	+13	+48
¼ to ⅜	47	30½	½	23	7
½	53	42½	¾	28	12
¾	58	47½	1 to 2	34	18
1 to 1½	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	½	29	13
2½ to 4	57	46½	2½ to 4	34	20
4½ to 6	56	45½	4½ to 6	33	19
7 to 8	52	39½	7 and 8	31	17
9 and 10	45	32½	9 to 12	21	8
11 and 12	44	51½			

On carloads the above discounts on steel pipe are increased on block by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		Charcoal Iron	
2 in. and 2¼ in.	40	1½ in.	1
2½ in.—2¾ in.	48	1¾ in.	8
3 in.	54	2 in.—2¼ in.	13
3¼ in.—3¾ in.	56	2½ in.—2¾ in.	16
4 in.	59	3 in.	17
4½ in. to 6 in.	48	3¼ in. to 3½ in.	18
		4 in.	20
		4½ in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	63	3 in.	48
1¼ to 1½ in.	55	3¼ to 3½ in.	50
1¾ in.	39	4 in.	53
2 to 2¼ in.	34	4½, 5 and 6 in.	42
2½ to 2¾ in.	42		

Hot Rolled

2 and 2¼ in.	40	3¼ to 3½ in.	56
2½ and 2¾ in.	48	4 in.	59
3 in.	54	4½, 5 and 6 in.	48

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb. base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points, with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage take mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base (carloads)	55
Carbon, 0.30% to 0.40%, base	50

Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

some cases run well into August. Hot weather curtailed production slightly during the last two weeks of June, but shipments were at a record for the month. Mills have had little opportunity to catch up on deliveries, especially of blue annealed sheets, on which six weeks is still considered a representative shipping promise. At some mills a slight recession would almost be welcomed, as wear on equipment is becoming a more important factor in production. In some cases the mid-week is being utilized for repairs. The leading interest, along with several independents, does not expect to operate its mills this week after Wednesday night. Operations last week were at about 95 per cent of theoretical capacity in this and nearby districts, a figure which approaches the physical limits of the mills during the summer months. Prices are fairly satisfactory, except on galvanized sheets, where concessions of $2 a ton from the recent minimum are still met in sales to jobbers. This develops a range of 3.50c. to 3.70c., Pittsburgh, but the market is well represented at 3.60c., with sales reported at both the top and bottom of the range. The 3.50c. price is said to be made only by companies which sell the run of the mill on sheets for roofing purposes and thus are able to realize a greater profit by shading the market $2 a ton than by offering seconds to the trade. On black sheets, the market is represented by a range of 2.85c. to 2.95c., the amount of the tonnage and the urgency of delivery usually determining the price. Blue annealed sheets and light plates are well established at the quoted prices, and concessions are seldom reported on automobile body or furniture sheets.

Tin Plate.—Specifications are still rather slow, but sentiment in the market at the end of the month was probably better than at the beginning. Crop reports are now generally more optimistic, and it is now thought that the loss in the California fruit pack will be practically offset by increased vegetable canning. No serious losses have been reported in other parts of the country, and tin plate makers are again voicing the opinion that the year will prove a record in production. Though the first five months were unusually busy ones, the recent recession in demand had threatened a more serious slump than has actually developed. The leading interest operated its mills last week at 90 per cent of capacity, a slightly better rate than was maintained by the independents. Operations will not be resumed at most mills this week after the Thursday holiday.

Strip Steel.—Shipments of strip steel in June ran from 10 to 15 per cent under May, but the month was considered satisfactory by most makers in view of the expected decline at this time of the year. Tonnage releases during the month were just about equal to shipments, so mill backlogs were not materially reduced. On the narrower widths of hot-rolled material, delivery promises average three or four weeks, but much better shipments are possible on the wider sizes. On the cold-rolled material, the situation is hardly so good. Mills are having difficulty in maintaining the quoted prices on cold-rolled strip. The 2.75c., Pittsburgh, minimum is holding fairly well, but the $2 premium asked for small orders and difficult specifications is more difficult to get, largely because a few producers are more anxious than they were to fill out production schedules.

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.25c.
Hoops	4.25c.
Black sheets (No. 24), 25 or more bundles	3.80c.
Galv. sheets (No. 24), 25 or more bundles	4.55c.
Blue ann'l'd sheets (No. 10), 1 to 10 sheets	3.45c.
Galv. corrug. sheets (No. 28), per square	$4.43
Spikes, large	3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count,	60 per cent off list
Machine bolts, 100 count,	60 per cent off list
Carriage bolts, 100 count,	60 per cent off list
Nuts, all styles, 100 count,	60 per cent off list
Large rivets, base per 100 lb.	$3.50
Wire, black soft ann'l'd, base per 100 lb.	$3.00 to 3.10
Wire, galv. soft, base per 100 lb.	3.00 to 3.10
Common wire nails, per keg	3.00
Cement coated nails, per keg	3.05

Cold-Finished Steel Bars.—Business showed a declining tendency during June, but the last week brought a check in the form of more encouraging specifications. If the present rate can be maintained in July the summer would be very satisfactory, but demand is rather spotty. Conflicting reports from the automobile industry, normally a large consumer, add to the uncertainty of the situation. Orders on mill books are sufficient for two to three weeks' operations. Prices are well maintained at 2.30c., base, Pittsburgh.

Coke and Coal.—The market on foundry coke is very quiet, and shipments last week again declined. Hot weather is partly responsible for lack of foundry activity, but slow operations among many of the large consumers in the district are fully reflected in the coke market. Merchant producers of furnace coke continue to curtail production and the market owes its apparent strength to the close adjustment of supply to demand. The price is unchanged at $2.75 to $2.85 a ton, Connellsville. Coal prices are still badly demoralized, but improvement is expected in a few weeks with the resumption of domestic demand. Pennsylvania producers have sold a small amount of Lake coal, principally in special grades, as they cannot compete with West Virginia producers in this market on the regular run of business.

Old Material.—The scrap market has passed through another quiet week, with sales confined entirely to lots of less than 5000 tons and prices well within the $18 to $18.50 range on No. 1 heavy melting steel. A very recent mill purchase at $18 on this grade might be construed as giving the market a weaker tone, but the Pennsylvania Railroad steel is said to have brought slightly more than $19. Details of this sale are not yet generally known in this district, but, as the steel is reported to have gone principally to one consumer which is usually willing to pay a 50c. premium over the market for regular No. 1 steel, the market does not seem to be quotably lower on this grade. On the other hand, sales of hydraulic compressed sheets have been made at $18.50 as well as at $18.25, an advance of 25c. a ton over last week. Compressed sheets have entered this district very freely in the last week or two, resulting in holdups at at least two points, but recent sales indicate that this has not yet had a depressing influence on the price. Sales of machine shop turnings and of borings and turnings at slightly lower prices, however, have resulted in a decline of 25c. a ton on these grades. The Baltimore & Ohio list, which will close July 8, contains 19,000 tons.

Prices per gross ton delivered consumers yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	$18.00 to $18.50
No. 2 heavy melting steel	15.50 to 16.00
Heavy melting car sides	17.00 to 17.50
Scrap rails	17.25 to 17.75
Compressed sheet steel	18.00 to 18.50
Bundled sheets, sides and ends	16.25 to 16.75
Cast iron carwheels	16.00 to 16.50
Sheet bar crops, ordinary	18.50 to 19.00
Heavy breakable cast	12.50 to 13.00
No. 2 railroad wrought	18.00 to 18.50
Hvy. steel axle turnings	16.00 to 16.50
Machine shop turnings	11.25 to 11.75
Acid Open-Hearth Grades:	
Railr. knuckles and couplers	21.00 to 21.50
Railr. coil and leaf springs	21.00 to 21.50
Rolled steel wheels	21.00 to 21.50
Low phos. billet and bloom ends	22.00 to 22.50
Low phos., mill plates	22.00 to 22.50
Low phos., light grades	20.00 to 20.50
Low phos., sheet bar crops	20.00 to 21.00
Heavy steel axle turnings	16.00 to 16.50
Electric Furnace Grades:	
Low phos., punchings	19.50 to 20.50
Hvy. steel axle turnings	16.00 to 16.50
Blast Furnace Grades:	
Short shoveling steel turnings	11.75 to 12.25
Short mixed borings and turnings	11.75 to 12.25
Cast iron borings	11.75 to 12.25
Rolling Mill Grades:	
Steel car axles	21.50 to 22.00
Cupola Grades:	
No. 1 cast	15.00 to 16.00
Rails 3 ft. and under	20.00 to 21.00

Ohio Foundries Association, Inc., will hold its annual convention the latter part of September aboard an Ohio River steamer en route from Cincinnati to Ashland, Ky., and return. The trip is expected to take three days.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

Billets and Blooms

	Per Gross Ton
Rerolling, 4 in. and under 10 in., Pittsburgh	$35.00
Rerolling, 4 in. and under 10 in., Youngstown	35.00
Rerolling, 4 in. and under 10 in., Cleveland	35.00
Rerolling, 4 in. and under 10 in., Chicago	37.00
Forging quality, Pittsburgh	$40.00 to 41.00

Sheet Bars

(Open Hearth or Bessemer)

	Per Gross Ton
Pittsburgh	$35.00
Youngstown	35.00
Cleveland	35.00

Slabs

(8 in. x 2 in. and under 10 in. x 10 in.)

	Per Gross Ton
Pittsburgh	$35.00
Youngstown	35.00
Cleveland	35.00

Skelp

(F.o.b. Pittsburgh or Youngstown)

	Per Lb.
Grooved	1.85c. to 1.90c.
Universal	1.85c. to 1.90c.
Sheared	1.85c. to 1.90c.

Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	$42.00
Cleveland	42.00
Chicago	43.00

Prices of Raw Material

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.80
Old range non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algerian	10.00c.
Iron ore, low phos., Swedish, average 68% iron	10.00c.
Iron ore, basis Swedish, average 65% iron	9.00c.
Manganese ore, washed, 52% manganese, from the Caucasus	33.00c. to 35.00c.
Manganese ore, Brazilian, African or Indian, basic 50%	33.00c. to 35.00c.
Tungsten ore, high grade, per unit, in 60% concentrates	$15.00 to $15.50

	Per Gross Ton
Chrome ore, 45 to 50% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $24.00

	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.75 to $2.85
Foundry, f.o.b. Connellsville prompt	3.75 to 4.85
Foundry, by-product, Ch'go ovens	8.00
Foundry, by-product, New England, del'd	11.00
Foundry, by-product, Newark or Jersey City, delivered	9.00 to 9.40
Foundry, by-product, Phila.	9.00
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry by-prod., del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.25 to $1.75
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to 1.75
Gas coal, ¾-in. f.o.b. Pa. mines	1.90 to 2.00
Mine run gas coal, f.o.b. Pa. mines	1.65 to 1.75
Steam slack, f.o.b. W. Pa. mines	80c. to 90c.
Gas slack, f.o.b. W. Pa. mines	1.00 to 1.10

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard	$105.00
Foreign, 80%, Atlantic or Gulf port, duty paid	105.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$31.00 to $34.00
Domestic, 16 to 19%	29.00 to 32.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$83.50
75%	130.00

	Per Gross Ton Furnace		Per Gross Ton Furnace
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	45.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio Furnace

	Per Gross Ton		Per Gross Ton
10%	$31.00	12%	$35.00
11%	33.00		

Silvery Iron

F.o.b. Jackson County, Ohio Furnace

	Per Gross Ton		Per Gross Ton
6%	$24.00	10%	$29.00
7%	25.00	11%	31.00
8%	26.00	12%	33.00
9%	27.00		

Other Ferroalloys

Ferrotungsten, per lb., contained metal del'd	$1.40 to $1.50
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$160.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton	$91.00
Ferrophosphorus, electric 24%, f.o.b. Anniston, Ala., per gross ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride not over 5% silicon, gravel, f.o.b. Illinois and Kentucky mines	$18.00
No. 2 lump, Illinois and Kentucky mines	20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$18.00 to $18.50
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	32.50

Fire Clay Brick

	Per 1000 f.o.b. Works: High-Heat Duty Brick	Intermediate Heavy Duty Brick
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	.....
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Illinois	43.00 to 46.00	35.00 to 38.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Standard size	45.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	70
†Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagons	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.

†Bolts with rolled thread up to and including ⅛ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagons nuts	70
Semi-finished hexagons castellated nuts, S.A.E.	70
Stove bolts in packages, P'gh	75, 20, 10 and 5
Stove bolts in packages, Chicago	75, 20, 10 and 5
Stove bolts in packages, Cleveland	75, 20, 10 and 5
Stove bolts in bulk, P'gh	75, 20, 10, 5 and 2½
Stove bolts in bulk, Chicago	75, 20, 10, 5 and 2½
Stove bolts in bulk, Cleveland	75, 20, 10, 5 and 2½
Tire bolts	60, 5 and 5

Discounts of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders discounts of 55, 60 per cent apply.

Large Rivets

(½-In. and Larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$3.10
F.o.b. Chicago	3.20

Small Rivets

(7/16-In. and Smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70 and 10
F.o.b. Cleveland	70 and 10
F.o.b. Chicago	70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10 and 5
Milled standard set screws, case hardened	80 and 5
Milled headless set screws, cut thread	75 and 10
Upset hex. head cap screws, U.S.S. thread	85
Upset hex. cap screws, S.A.E. thread	85
Upset set screws	80, 10 and 5
Milled studs	70

Chicago

Steel Order Books Unusually Heavy as Second Half Begins—Contracts and Specifications Large

CHICAGO, July 2.—Chicago steel mills have established a new six-months' record. Shipments for January to June, inclusive, were fully 15 per cent heavier than in the corresponding period last year, while sales and also specifications were 20 to 25 per cent larger. Order books are considerably heavier than at this time last year.

Sales in the past week were the fifth largest this year, with forward buying gaining rapidly. Mill order books are unusually heavy, and a high rate of operations seems assured for the summer months. Current sales totals are little influenced by new purchases of rails. Contracts for semi-finished steel are larger than is usually expected at the opening of the third quarter. Finished steel specifications are easily equal to the average week this year and well above the rate in 1928. Releases match shipments. Ingot production remains at capacity.

The tendency for deliveries of finished steel to improve, as noted a week ago, has been checked.

It is interesting that not a single Chicago steel mill blast furnace has been taken out of service for relining in three months nor for lack of orders since the beginning of the year.

The Chicago & North Western has postponed until fall the purchase of 1000 to 2500 box cars.

Structural awards are augmented by an award for 3000 tons for a bridge at Peoria, Ill.

Pig Iron.—Iroquois furnace No. 5 has been taken out of service for relining. Plans are to have it in blast again in 30 days. Merchant stacks now in blast are one at Duluth, two Federal and two Iroquois. Shipments from local furnaces in the past six months were the largest in history. Current releases are large, and pressure for prompt delivery is as urgent as in recent months.

Sellers' order books are large, and there is a growing disposition on the part of buyers to seek tonnage for the remainder of the year. Local furnaces are holding to $20 a ton, while offerings of boat iron are to be had at 50c. a ton less. Many foundries in this district will take more than the one holiday this week. Charcoal iron is active in lots up to 200 tons at $24 a ton, furnace. Southern iron is moving in here in small quantities.

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$20.00
N'th'n No. 1 fdy., sil. 2.25 to 2.75	20.50
Malleable, not over 2.25 sil.	20.00
High phosphorus	20.00
Lake Super. charcoal, sil. 1.50	27.04
So'th'n No. 2 fdy. (all rail)	$20.51 to 21.01
Low phos., sil. 1 to 2, copper free	29.50
Silvery, sil. 8 per cent	30.79
Bess. ferrosilicon, 14-15 per cent	46.29

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Ferroalloys.—This market is quiet in new sales. Specifications against past commitments show little change from the average in recent weeks.

Prices delivered Chicago: 80 per cent ferromanganese, $112.56; 50 per cent ferrosilicon, $83.50 to $88.50; spiegeleisen, 19 to 21 per cent, $40.76.

Structural Material.—Awards for the week total 7500 tons, and inquiries are for not less than 5500 tons. It is reported here that the Peoria, Ill., bridge, requiring 3000 tons, is being held in check while details of the general contract are being arranged. This market is more active both in Milwaukee and locally.

Mill prices on plain material, per lb.: 2.05c. to 2.15c. base, Chicago.

Cast Iron Pipe.—Demand for cast iron pipe in this district still drags. The outlook is none too promising, though some in the trade foresee more active inquiry toward the end of the summer months. It is reported here that pipe foundries are operating at between 60 and 70 per cent of capacity. Deliveries are prompt on most sizes. Railroads are finding little use for cast iron pipe at this time. Nor are public utilities interested in additional tonnages, but they are specifying freely against commitments made earlier in the year. Carload buyers are less numerous this week than in the closing days of June. The American Cast Iron Pipe Co. will furnish 100 tons of 6 to 10-in. pipe for Monroe, Mich., and the Alabama Pipe Co. will ship 200 tons to Niles Center, Ill. The National Cast Iron Pipe Co. has taken 24,000 ft. of 6 and 8-in. pipe for Weston, Ohio, and 400 tons of 6 and 8-in. pipe for Dearborn Township, Mich. Hinsdale, Ill., will open bids July 21 on a round tonnage of cast iron pipe for a sewage disposal plant.

Prices per net ton, del'd Chicago: Water pipe, 6-in. and over, $45.20 to $46.20; 4-in., $49.20 to $50.20; Class A and gas pipe, $3 extra.

Hot-Rolled Strips.—Specifications from automobile frame manufacturers are slightly smaller. Other users, however, are still taking liberal quantities. Prices are steady. Third quarter contracts bulk large.

Semi-Finished Steel.—This commodity is still scarce, and producers find it necessary to continue the practice of careful apportionment among various finishing mills. Allotment to non-integrated users is still as strict as it was a month ago. Forward contracts are well covered and in the aggregate bulk larger than at the opening of the second quarter.

Sheets.—Prices remain steady in the nearby Chicago territory. Mill quotations are 2.45c. a lb. for blue annealed sheets, 3.80c. for galvanized and 3.05c. for black sheets. Quotations are demoralized in the Southwest, where mills served by the Gulf ports and inland waterways meet in sharp competition. Buying for the third quarter continues, but the pace is slow, and, as a result, books for the coming three months are not heavy. Releases against commitments are liberal, and local hot mills continue to produce at the rate of 85 per cent of capacity. Output for this week will be curtailed because of the holiday. Jobbers are taking liberal quantities, but agricultural machinery manufacturers find their needs are not as heavy as recently. There is also more spottiness in the demand from miscellaneous sources, such as locker and light tank makers.

Base prices per lb., deliv'd from mill in Chicago: No. 24 black sheets, 3.10c.; No. 24 galv., 3.85c.; No. 10 blue ann'l'd, 2.35c. Deliv'd prices at other Western points are equal to the freight from Gary, plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

Rails and Track Supplies.—Foremost among rail inquiries is one for 39,000 tons for the Norfolk & Western. Western producers do not expect to participate in the tonnage. Purchases from local mills total more than 10,000 tons, 3500 tons from an Illinois railroad, 5000 tons from frog and switch makers and about 600 tons in small miscellaneous lots. Several new inquiries are in the making. Western railroads have ordered 3000 tons of track fastenings, and fresh inquiry before the trade is for not less than 9000 tons. Additional releases of standard-section rails now assures an unchanged rate of output for all of July. Track supply departments are operating at normal capacity for this time of the year. Several carloads of light rails have been ordered.

Prices f.o.b. mill, per gross ton: Standard section open-hearth and Bess. rails, $43; light rails, rolled from billets, $36. *Per lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.15c.; angle bars, 2.75c.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforc'g bars, billet steel	2.10c. to 2.40c.
Reinforc'g bars, rail steel	1.90c. to 2.05c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Bands (¼ in. in Nos. 10 and 12 gages)	3.20c.
Hoops (No. 14 gage and lighter)	3.75c.
Black sheets (No. 24)	4.05c.
Galv. sheets (No. 24)	4.90c.
Blue ann'l'd sheets (No. 10)	3.35c.
Spikes, ⅜ in. and larger	3.55c.
Track bolts	4.55c.
Rivets, structural	4.00c.
Rivets, boiler	4.00c.

	Per Cent Off List
Machine bolts	60
Carriage bolts	60
Coach or lag screws	60
Hot-pressed nuts, sq., tap. or blank	60
Hot-pressed nuts, hex., tap. or blank	60
No. 8 black ann'l'd wire, per 100 lb.	$3.45
Com. wire nails, base per keg	3.20
Cement c't'd nails, base per keg	3.20

Wire Products.—June shipments of wire and wire products, taken as a whole, were heavier than in any sixth month for the past six years. Deliveries for the first half have established a record in all products except nails and woven wire fencing. Demand for these last-named commodities has been spotty through most of the year, nails influenced by building operations in general, and fencing by unseasonable weather. On the whole, demand is well sustained by most users, with the exception of automobile and farm implement manufacturers. Forward contracting by the manufacturing trade has progressed rapidly, and the total of orders on producers' books compares favorably with the volume at the opening of the second quarter. Shipments to the jobbers in June were above normal and requirements are not changed as the second half opens. Wire mill output is steady at 70 per cent of capacity. Prices for nails are less steady to the west and southwest of Chicago.

Reinforcing Bars.—Building permits are still seasonably small, averaging 40 per cent below June last year. This situation is having a marked effect not only in the matter of tonnage booked, but also in prices, which lack strength because of keen competition for going tonnages. Shops have been pressed for delivery in recent weeks against old projects. This stress is growing less and new business is not sufficient to support current pending operations. On the brighter side of the market is the fact that June sales topped those of May by a fair margin, but the outlook for July is not particularly promising from the viewpoint of pending tonnage. Fresh inquiry is quiet.

Bolts, Nuts and Rivets.—Specifications are a trifle lighter, as manufacturers of farm machinery find their needs are less urgent. Users generally have not built up stocks, and only moderate assortments are in the hands of producers. Spot orders are more numerous. Prices are firm.

Old Material.—June shipments to consumers were equal to the volume in May. Brokers' books are large, and efforts are being directed largely toward covering old orders. Heavy melting steel is moving freely to local mills, which are finding less reason to reject incoming scrap. Steel foundries are operating at a steady rate, while the malleable foundry business is growing spotty. Pressure placed on sellers for prompt shipment of carloads reflects the low condition of stocks at most foundries. New demand for railroad malleable is light, and brokers are having little difficulty in obtaining this grade at $17.25 a gross ton, delivered. One mill is holding back shipments of bundles. Sellers are having difficulty in placing this tonnage as it appears on tracks. Cast iron car wheels have been purchased locally for delivery to Kokomo, Ind., at $13.60 a gross ton on track. This is equivalent to $14.10 a gross ton, delivered Chicago. The price paid at Kokomo was $16. The Chicago & North Western is offering 6000 tons.

Prices deliv'd Chicago district consumers:

	Per Gross Ton	
Basic Open-Hearth Grades:		
Heavy melting steel	$14.75 to	$15.25
Shoveling steel	14.75 to	15.25
Frogs, switches and guards, cut apart, and misc. rails	16.25 to	16.75
Hydraul. compressed sheets	13.00 to	13.50
Drop forge flashings	10.50 to	11.00
No. 1 busheling	13.00 to	13.50
Forg'd cast and r'l'd steel carwheels	18.25 to	18.75
Railroad tires, charg. box size	18.50 to	19.00
Railroad leaf springs cut apart	18.50 to	19.00
Acid Open-Hearth Grades:		
Steel couplers and knuckles	16.75 to	17.25
Coil springs	19.00 to	19.50
Electric Furnace Grades:		
Axle turnings	14.50 to	15.00
Low phos. punchings	16.50 to	17.00
Low phos. plates, 12 in. and under	16.50 to	17.00
Blast Furnace Grades:		
Axle turnings	10.75 to	11.25
Cast iron borings	9.75 to	10.25
Short shoveling turnings	9.75 to	10.25
Machine shop turnings	7.00 to	7.50
Rolling Mill Grades:		
Iron rails	16.00 to	16.50
Rerolling rails	17.50 to	18.00
Cupola Grades:		
Steel rails less than 3 ft.	18.00 to	18.50
Steel rails less than 2 ft.	18.50 to	19.00
Angle bars, steel	17.00 to	17.50
Cast iron carwheels	14.00 to	14.50
Malleable Grades:		
Railroad	17.25 to	17.75
Agricultural	15.75 to	16.25
Miscellaneous:		
*Relaying rails, 56 to 60 lb.	23.00 to	25.00
*Relaying rails, 65 lb. and heav.	26.00 to	31.00
	Per Net Ton	
Rolling Mill Grades:		
Iron angle and splice bars	15.00 to	15.50
Iron arch bars and transoms	21.00 to	21.50
Iron car axles	26.00 to	26.50
Steel car axles	16.50 to	17.00
No. 1 railroad wrought	13.50 to	14.00
No. 2 railroad wrought	13.00 to	13.50
No. 1 busheling	9.00 to	9.50
No. 2 busheling	7.00 to	7.50
Locomotive tires, smooth	14.50 to	15.00
Pipes and flues	10.00 to	10.50
Cupola Grades:		
No. 1 machinery cast	14.50 to	15.00
No. 1 railroad cast	13.75 to	14.25
No. 1 agricultural cast	13.25 to	13.75
Stove plates	12.25 to	12.75
Grate bars	11.75 to	12.25
Brake shoes	10.50 to	11.00

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Bars.—Current demands for mild steel bars are lighter by a small margin. Steel shipments to the automobile trade continue to taper, but the change is slight and the effect is noticeable mostly in the medium-priced car field, for which July shipping schedules will be sharply below those for June. Farm implement manufacturers, though feeling free to make liberal contracts, are finding less immediate need for steel. Some look on this situation solely as a seasonal influence. Forgers, though still operating at a high rate, are feeling the effects of a duller demand from automobile builders. Shipments to road machinery manufacturers have not changed in many weeks. New buying in iron bars is dull; specifications are of moderate size. The bulk of car builders' needs are filled for the present. Output of alloy steel bars is holding at 85 per cent of capacity. Prices are firm. Third quarter contracts total about the same as at the opening of the second quarter. Specifications for rail steel bars are equal to production and to shipments. Buyers are taking more interest in future needs. Mills near Chicago are operating on a double turn basis. The mill at Moline, Ill., will be down for repairs until about July 15.

Plates.—Forward contracting is active, tank builders alone in this district accounting for more than 8000 tons. A refiner in the Southwest has ordered 1500 tons of tank plates. The White Star Refining Co., Detroit, is in the market for 2000 to 3000 tons of plates. Total inquiry for tank work now before the trade is impressive at 15,000 tons. The consumption of plates is heavy in this district. Shipments are holding to the rate of recent weeks and specifications are in such size that improvement in deliveries, noted a week ago, has been checked. Western car builders appear to be at the peak of their present construction programs and their needs for steel are large. It is estimated in some quarters that they have about two months' work ahead. Plate demands for pipe manufacture are heavy.

Coke.—The Chicago market is active in spot sales. Shipments are curtailed somewhat this week as a result of the holiday, which in some instances will extend over Thursday, Friday and Saturday.

O'Fallon Decision Should Stimulate Buying

That the recent decision of the United States Supreme Court in the O'Fallon case should have a favorable effect on the general railroad situation and should stimulate the interest of carriers in acquiring new equipment is the opinion expressed by W. H. Woodin, president American Car & Foundry Co., in the thirtieth annual report of the company. Mr. Woodin states that "fortunately the company's earning capacity is not entirely dependent upon its manufacture and sale of railroad equipment. Unceasing care has been given to the extension of its business in miscellaneous products. That branch of its activities is now one of very considerable magnitude and produces a substantial proportion of its earnings."

Net earnings for the year ended April 30, 1929, were $2,715,174.28, compared with $3,754,555.05 in the previous fiscal year.

An engineering and sales office has been opened by Carrier Engineering Corporation, Newark, N. J., in the Buhl Building, Detroit, in charge of Herbert Peacock. This takes the place of temporary engineering offices in Detroit occasioned by large work in process there in air conditioning, cooling and ventilating systems. Mr. Peacock has been engineering assistant to the sales manager of the company.

New York

Pig Iron Buyers Still Cautious — Structural Activity Continues—Other Steel Buying Steady

NEW YORK, July 2.—The opening of the third quarter finds the pig iron market quiet. Sales in this district for the week totaled only 6000 or 7000 tons, and inquiries are not numerous. Inventory considerations may partly explain the attitude of buyers and a certain amount of second quarter tonnage is still to be delivered, but the general lack of interest in contracts is probably accounted for mainly by the price situation. Melters see no object in obligating themselves for the next three months when there are no indications of an advancing market. Moreover, the possibility of more active competition in this district on the part of Alabama furnaces is regarded as a further reason for caution. On the other hand, those who count on larger offerings of merchant iron by steel companies may be disappointed, since steel production promises to show little diminution in the next month or two. The inquiry for 2000 tons by the General Fire Extinguisher Co., Providence, R. I., is still open, but the General Electric Co. has closed for at least part of the 6000 tons on which it took figures. Two current inquiries calling for deliveries to plants outside of this district involve a total of 10,000 tons. Northern brands of foundry iron continue to range from $17.50 to $18, base Buffalo, or the equivalent.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	$22.41 to $22.91
*Buf. No. 2, del'd east. N. J.	20.78 to 21.28
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	21.39 to 22.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	21.89 to 23.02

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.

*Price delivered to New Jersey cities having rate of $3.28 a ton from Buffalo.

Ferroalloys.—Sales of ferromanganese in the past week or two have totaled several hundred tons at the regular quotation of $105, seaboard basis. The Ford Motor Co. is inquiring for 800 tons. Demand for spiegeleisen is confined to carload and small lots. Specifications on contract for both of these alloys and for other standard ferroalloys are very heavy.

Reinforcing Bars.—The Jones & Laughlin Steel Corporation will supply 1400 tons of bars for the automobile storage building of the New York Central Railroad at West End Avenue and Sixty-fifth Street. Otherwise, awards have consisted only of small tonnages. Inquiries are scarce. Prices, however, are firm and unchanged.

Billet steel reinforcing bars in 40, 50 and 60-ft. lengths, 2.05c. per lb., Pittsburgh, and 2.30c. per lb., Pittsburgh warehouse, for cut lengths. Out of New York warehouse, 2.90c. per lb. for lots of 5 tons or more, 3.05c. for lots of 2 to 5 tons and 3.30c. for less than 2 tons, all delivered at job.

Finished Steel.—Although steel business continues good in nearly all branches, the structural field is leading in strictly new business. Among the projects which have come up for bids are five which total more than 25,000 tons. These are: 9500 tons for subway work, 6000 tons for a building at Fifth Avenue and Fifty-eighth Street, 4000 tons for a building for the New York Telephone Co., 3900 tons for repairs to the Queensborough bridge and 1725 tons for a New York Central Railroad viaduct. In specifications and new business, June was an exceptionally good month, though the total tonnage of most of the local steel offices fell below that of May. With respect to consumers' requirements in July and August, the general opinion is that no severe curtailment in consumption in this district is in sight. The demand for full finished and special finished sheets is especially strong.

Mill prices per lb., deliv'd New York: Soft steel bars, 2.29c.; plates, 2.22½c.; structural shapes, 2.19½c.; bar iron, 2.14c.

Warehouse Business.—June sales from stock have not quite measured up to the May total, which was one of the largest for any month in the first half of the year. Business in structural steel has declined slightly, and other steel products are less active. Black and galvanized sheet prices are still subject to shading of $1 and $2 a ton. Jobbers have not yet revised their quotations on blue annealed sheets to the new mill bases.

Cast Iron Pipe.—New inquiry for pressure pipe is limited to small lots to complete contracts. Yonkers, N. Y., opens bids July 5 on 1000 tons of 12-in. and 1800 tons of 18-in. water pipe. At the recent opening of bids at Hyattsville, Md., by the Washington suburban sanitary district, on 1675 tons of 6 to 12-in. water pipe, low bids were submitted for both sand cast and centrifugally cast pipe by the United States Pipe & Foundry Co. as follows: On 10,000 ft. of 6-in., Class B, $36 a ton; Class 150, $0.4949 a ft.; 15,000 tons of 8-in. Class B, $36.60 a ton; Class 150, $0.6972 a ft.; 6000 tons of 10-in. Class B, $37 a ton; Class 150, $0.9579 a ft.; 3000 ft. of 12-in. Class B, $36.60 a ton; Class 150, $1.2425 a ft. The freight rate from Northern foundries to the Washington district is about $3.70 a net ton.

Prices per net ton deliv'd New York: Water pipe, 6-in. and larger, $33.60 to $35.60; 4-in. and 5-in., $36.60 to $38.60; 3-in., $43.60 to $45.60. Class A and gas pipe, $3 extra.

Coke.—Demand is light and prices are unchanged. Standard furnace is quoted at $2.75 to $2.85 a net ton, Connellsville. Special brands of beehive coke are $4.85 a net ton, ovens, or $8.56, delivered to northern New Jersey, Jersey City and Newark and $9.44 to New York and Brooklyn. By-product coke is quoted at $9 to $9.40 per net ton, Newark or Jersey City and $10.06, New York or Brooklyn.

Old Material.—No. 1 heavy melting steel is being bought by brokers at

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.30c.
Soft steel bars, small shapes	3.25c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	7.00c. to 7.25c.
Cold-fin. shafting and screw stock—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Cold-roll. strip, soft and quarter hard	5.15c. to 5.40c.
Hoops	4.25c.
Bands	3.75c.
Blue ann'l'd sheets (No. 10)	3.85c. to 3.90c.
Long terne sheets (No. 24)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galv. annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases,	4.50c. to 7.00c.

	Per Cent Off List
Machine bolts, cut thread:	
¾ x 6 in. and smaller	60
1 x 30 in. and smaller	50 to 50 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	60
¾ x 20 in. and smaller	50 to 50 and 10
Coach screws:	
½ x 6 in. and smaller	60
1 x 6 in. and smaller	50 to 50 and 10

	Per 100 Ft.
Boiler Tubes—	
Lap welded, 2-in.	$17.33
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
½-in. butt	46	29
¾-in. butt	51	37
1-3-in. butt	53	39
2½-6-in. lap	48	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
½-in. butt	5	+19
¾-in. butt	11	+ 9
1-1½-in. butt	14	+ 6
2-in. lap	5	+14
3-6-in. lap	11	+ 6
7-12-in. lap	3	+16

Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20
Charcoal, per Box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 x 20 in.)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	3.80c.
No. 22	3.95c.
No. 24	4.00c.
No. 26	4.10c.
No. 28*	4.25c.
No. 30	4.50c.

Sheets, Galvanized

	Per Lb.
No. 14	4.40c.
No. 16	4.25c.
No. 18	4.40c.
No. 20	4.50c.
No. 22	4.60c.
No. 24	4.75c.
No. 26	5.00c.
No. 28*	5.25c.
No. 30	5.65c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

$15.50 to $15.75 a ton, delivered Claymont, Del., and at $16 a ton, delivered Coatesville, Conshohocken or Bethlehem, Pa. Occasionally brokers offer $16.25 a ton, delivered to Coatesville and Conshohocken. No. 2 heavy melting steel is quoted at $13 a ton, delivered Harrisburg, Pa., and up to $13.75 a ton, delivered to Conshohocken or Pencoyd, Pa. The available supply of No. 2 steel is not large, and prices are firm. Other grades of scrap are inactive, and prices are unchanged.

Dealers' buying prices per gross ton, f.o.b. New York:

No. 1 heavy melting steel	$12.00 to	$13.35
Heavy melting steel (yard)	8.00 to	9.50
No. 1 hvy. breakable cast.	10.75 to	12.00
Stove plate (steel works).	7.75 to	8.25
Locomotive grate bars....	8.25 to	8.75
Machine shop turnings....	7.25 to	7.50
Short shoveling turnings..	7.25 to	7.50
Cast borings (blast furn. or steel works).....	7.00 to	7.25
Mixed borings and turnings	6.75 to	7.25
Steel car axles.....	19.25 to	19.75
Iron car axles.....	24.00 to	25.00
Iron and steel pipe (1 in. dia., not under 2 ft. long)		11.25
Forge fire	9.50 to	10.00
No. 1 railroad wrought....	12.00 to	12.50
No. 1 yard wrought, long..	11.00 to	11.50
Rails for rolling.....	13.00 to	13.50
Cast iron carwheels.....	12.00 to	12.25
Stove plate (foundry)....	8.25 to	8.50
Malleable cast (railroad).	14.00 to	14.50
Cast borings (chemical)..	10.00 to	10.50

Prices per gross ton, deliv'd local foundries:

No. 1 machry. cast.....	$17.00
No. 1 hvy. cast (columns, bldg. materials, etc.), cupola size.....	15.00
No. 2 cast (radiators, cast boilers, etc.)	14.50

E. Arthur Tutein, Inc., Awarded $302,500

E. Arthur Tutein, Inc., of Boston and New York, has been awarded a verdict of $302,500 by the arbiters in the proceeding brought against the Hudson Valley Coke & Products Corporation, Troy, N. Y.

The Tutein company was appointed agent for the Troy blast furnace and coke ovens in the sale of pig iron and coke, but the contract was terminated with some years still to run, and the Tutein company brought action under an agreement by which any disputes were to be submitted to arbitration.

Sherman Whipple, Boston lawyer, was arbiter for the Tutein company and United States Senator Wagner of New York served in like capacity for the Hudson Valley company. The third arbiter, Louis K. Comstock of New York, was appointed by Charles M. Schwab in his capacity of president of the American Iron and Steel Institute, a mode of selection which the arbitration contract called for.

It is stated that the damages assessed against the Hudson Valley company are for lost profits and do not cover an investment of $250,000 which E. Arthur Tutein made in the stock of the company.

In May jobbing foundries of Worcester, Mass., and vicinity produced 5,231,926 lb. of gray and malleable iron castings, the largest month's total thus far this year. Compared with May, 1928, the increase was from 3,683,065 lb., or 41.8 per cent.

Cleveland

Large Steel Operations Through July Assured By Present Backlogs—Automotive Orders Continue to Decline

CLEVELAND, July 2.—July started with enough business in finished steel on mill books to assure good operations through the month, although some of the sheet and strip mills could take on additional tonnage for late in July. Backlogs have been reduced and deliveries on most products have improved. However, not much gain has been made in shipments of steel bars, for which there is still pressure for delivery. Plate mills also have backlogs.

The volume of specifications the past week showed little change from recent weeks. Consuming industries outside the automotive field appear to continue at recent operations, and the demand for steel is expected to hold up well during the summer months.

Orders from the automotive industry continue to decline. With the seasonal slowing down in that field and curtailment due to bringing out new models, the July output of cars will show a sharp decline from that of June.

Quite a few parts manufacturers have received suspensions or cancellations that are reducing their operations. However, the industry will be well sustained during the summer months by production of some of the makers of low-priced cars. The July schedule of the Ford Motor Co. is understood to call for the production of 190,000 cars, or an increase over recent months.

With better mill deliveries and uncertainty over future schedules automobile companies are not buying steel for as extended requirements as a few weeks ago. Most consumers of steel bars, plates and structural shapes have covered with third quarter contracts. Waiving of chemical extras is reported in some cases on spring steel, but base prices are firm.

Structural inquiry is fair. Awards during the week included 4000 tons for a Toledo bank.

The Nickel Plate Railroad has placed 1000 tons of rails and the Wheeling & Lake Erie 1500 tons with a Pittsburgh district mill, supplementing their purchases early in the year. Steel bars are quoted at 1.95c., Cleveland and Pittsburgh, and plates and structural material at 1.95c., Pittsburgh.

Pig Iron.—Sales increased during the past week. Cleveland interests took orders for 36,000 tons of foundry and malleable iron, as compared with 17,000 tons in the previous week. An Ohio foundry purchased 4000 tons for last half. This company inquired for the same amount of iron for the first half of 1930, but furnaces declined to quote for shipment beyond January. The General Electric Co. closed for 1200 tons of foundry iron for its Erie works, and another Erie consumer bought 1000 tons. The inquiry from the Westinghouse Electric & Mfg. Co. for foundry iron for its Cleveland plant is still pending. Foundries, with few exceptions, are confining their purchases to the third quarter, and furnaces are not attempting to make sales for the entire last half. With the steady buying that has been going on for a number of weeks, most producers have a very good backlog of third quarter business. June shipments declined only about 10 per cent from those of May. Shipping orders to the automotive industry and other consumers have started this month at about the same rate as during June. Little interest is being taken in prices, as quotations that have prevailed for some time are being maintained. Cleveland furnaces quote foundry and malleable iron at $18.50, furnace, for outside shipment and at $19 for local delivery. In Michigan, the market is $20 on both grades. A sale of 200 tons of Southern foundry iron at $15, Birmingham, for shipment into this territory seems to establish that as the ruling price for small-lot business.

Prices per gross ton at Cleveland:

N'th'n fdy., sil. 1.75 to 2.25		$19.50
S'th'n fdy., 1.75 to 2.25....		21.00
Malleable		19.50
Ohio silvery, 8 per cent...		29.00
Basic Valley furnace.....		18.50
Stand. low phos., Valley..	26.50 to	27.00

Prices except on basic and low phosphorus are delivered Cleveland. Freight rates: 50c. from local furnaces; $3 from Jackson, Ohio; $6 from Birmingham.

Iron Ore.—The heavy movement of ore from the Lake Superior district, which started with the opening of navigation, continues. Shipments by water during June were 10,174,424 tons, an increase of 1,248,208 tons over June, last year. The total movement until July 1 was 22,239,938 tons, a gain of 7,944,813 tons, or more than 55 per cent above the same period last year.

Sheets.—With the decrease in the demand from the automotive industry, mill backlogs have been materially reduced, and some producers now need orders for auto body sheets, having only enough to keep their hot mills busy for two weeks. Some mills have also well caught up on black sheets. Others are well filled for from four to six weeks. Orders for round tonnages of auto body and black sheets for manufacturing 80,000 bodies for Chevrolet cars were distributed among several mills during the week. Good orders also came from barrel manufacturers. Resistance to the 2.95c., Pittsburgh, price on black sheets has become more pronounced, and 2.85c. is now fairly common. On galvanized sheets, 3.60c. has become more general. While there has been only slight reduction in mill operations, a number of mills

will not resume operations after the holiday shutdown until next Monday.

Strip Steel.—Specifications for both hot and cold-rolled strip have fallen off considerably, and deliveries are much better than recently except on hot strip in very narrow sizes, of which some of the mills have enough business on their books to carry them through August. Deliveries on wide hot-rolled strip can be secured in two weeks and on cold-rolled material in three weeks. Prices are firm. Most consumers have covered for the third quarter at regular quotations.

Alloy Steel.—Specifications were heavy during the last few days of June, considerable business being brought out by the price advance effective on third quarter contracts on small billets and slabs in certain sizes that resulted from putting these on a bar base. Mills also took a good volume of specifications for bars for July shipment. However, mill backlogs have been reduced considerably by the decreased demand from the automotive industry. Prices are firm.

Semi-Finished Steel.—There has not been much contracting for the third quarter, but contracts that have been closed have been at $35, Cleveland and Youngstown, for sheet bars, billets and slabs. This is the same price at which sheet bar contracts were written for the second quarter, but is an advance of $1 a ton for billets and slabs. That consumers are rather slow in placing contracts is evidently due partly to the fact that those receiving their supplies from a Cleveland mill will be securing shipments for about three weeks against second quarter contracts, as that producer is that far behind on deliveries. Until these shipments are completed these buyers will be getting billets and slabs at the $34 price.

Bolts, Nuts and Rivets.—June made a good showing in bolt and nut orders, but the volume of business was considerably less than in May. That the market will experience the usual seasonal decline in July is indicated by a further falling off in orders in the past few days. Production has been curtailed, manufacturers now operating their plants from 65 to 70 per cent of capacity. Rivet orders also show a decline. Prices are firm.

Coke.—Prices on some of the cheaper grades of Connellsville foundry coke have declined about 25c. a ton, but the better grades are firm at recent quotations. Ohio by-product coke is quoted at $8.25, Painesville, for July shipment. Specifications are fair.

Cold-Finished Steel.—Demand for screw stock has declined materially, but orders for alloy and high carbon wire from cap and set screw makers continue heavy, and deliveries on such material show no improvement.

Wire Products.—Nails are irregular, with $2.50 a keg not an uncommon price. Recent weakness in wire seems to have disappeared. Specifications are rather light.

Warehouse Business.—New extras on blue annealed sheets were generally adopted July 1. The base is unchanged at 3.25c. Warehouse business continues fairly good.

Old Material.—While the market is dull, most prices are holding to recent quotations. No. 1 heavy melting steel will be supplied to a Valley district mill during July at $17.50, the same price that it paid during June. Dealers are paying $17.50 to $17.75 for the heavier grades of No. 1 heavy melting steel to cover $18 contracts with Youngstown district mills. A Cleveland mill which has been restricting shipments of steel making scrap has cut off shipments entirely on this grade of material, evidently because of large stocks that it has accumulated in water shipments from Detroit. Dealers are buying blast furnace scrap in moderate quantities for shipment to a Cleveland consumer at quoted prices. Cast scrap is lower.

Prices per gross ton delivered consumers' yards:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$15.00 to $15.50
No. 2 heavy melting steel	14.50 to 15.00
Compressed sheet steel	14.50 to 15.00
Light bundled sheet stampings	12.00 to 12.50
Drop forge flashings	13.00 to 13.25
Machine shop turnings	9.25 to 9.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	16.00 to 16.50
No. 1 busheling	13.00 to 13.50
Pipes and flues	9.00 to 9.50
Steel axle turnings	12.50 to 13.00
Acid Open-Hearth Grades	
Low phos., forging crops	17.75 to 18.00
Low phos., billet, bloom and slab crops	18.50 to 18.75
Low phos., sheet bar crops	18.00 to 18.50
Low phos. plate scrap	18.00 to 18.50
Blast Furnace Grades	
Cast iron borings	10.75 to 11.00
Mixed borings and short turnings	10.75 to 11.00
No. 2 busheling	10.75 to 11.00
Cupola Grades	
No. 1 cast	16.75 to 17.25
Railroad grate bars	11.00 to 12.00
Stove plate	12.00 to 12.50
Rails under 3 ft	18.50 to 19.00
Miscellaneous	
Railroad malleable	18.00 to 18.50
Rails for rolling	16.25 to 16.50

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and struc. shapes	3.00c.
Soft steel bars	3.00c.
Reinforc. steel bars	2.25c. to 2.50c.
Cold-fin. rounds and hex.	3.65c.
Cold-fin. flats and sq.	4.15c.
Hoops and bands, No. 12 to 1/4 in., inclusive	3.25c.
Hoops and bands, No. 13 and lighter	3.65c.
Cold-finished strip	*5.95c.
Black sheets (No. 24)	3.70c. to 3.90c.
Galvanized sheets (No. 24)	4.60c. to 4.75c.
Blue ann'l'd sheets (No. 10)	3.25c.
No. 9 ann'l'd wire, per 100 lb.	$2.95
No. 9 gal. wire, per 100 lb.	3.40
Com. wire nails, base per keg	2.95

*Net base, including boxing and cutting to length.

Philadelphia

Sheet Prices Less Firm—Billet Market Steadier at $35 for New Contracts—Pig Iron Quiet

PHILADELPHIA, July 2.—Steel contracting for third quarter has been at about the same level as in the previous quarter. Specifications from consumers have been lighter recently, but mill operations are being maintained at a high level with deliveries slightly earlier than a few weeks ago. While production at certain steel mills has been curtailed somewhat in the past few weeks, the reduction has been largely necessitated by repairs to open-hearth furnaces, which will be returned to production as soon as possible.

Concessions of $1 to $2 a ton in the prices of black and galvanized sheets have become rather general.

Pig Iron.—Foundry iron prices are being maintained at $21 to $21.50 per ton, furnace, eastern Pennsylvania producers showing no inclination to meet the quotations of Southern sellers. Sales of Southern pig iron have been limited to occasional small lots of foundry and some trial shipments of basic bought a number of weeks ago. In many cases consumers are apparently unwilling to change the analysis of iron in their mixture, as the present low prices for Birmingham iron are considered a temporary condition, which will disappear when the present large stocks in the Birmingham district have been reduced. A test of the present price of eastern Pennsylvania iron appears likely from the inquiry of the National Radiator Co., Johnstown, Pa., for 3500 tons of foundry for its Trenton, N. J., plant. No sales of basic have been made since the recent purchase of 10,000 tons by a Claymont, Del., consumer at about $20 per ton, furnace.

Prices per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	$21.76 to $22.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	22.26 to 22.76
East. Pa. No. 1X	22.76 to 23.26
Basic (del'd east. Pa.)	20.25 to 21.00
Gray forge	20.50 to 21.00
Malleable	21.25 to 21.75
Stand. low phos. (f.o.b. N. Y. State furnace)	22.00 to 23.00
Cop. b'r'g low phos. (f.o.b. furnace)	23.50 to 24.00
Va. No. 2 plain, 1.75 to 2.25 sil.	24.04
Va. No. 2X, 2.25 to 2.75 sil.	24.54

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

Billets.—Following a few extensions of contracts into third quarter at $34 a ton, Pittsburgh, for rerolling billets, although $36 had been announced as the third quarter contract price, the market has apparently become stable at $35 a ton, Pittsburgh, for rerolling

billets and $40, Pittsburgh, for forging quality. Consumers are reported as well supplied with stocks, and, with shipments coming to them on old contracts, they are in most cases covered for part of this month.

Bars.—Contracting has been slightly less in volume for third quarter, partly because of diminished buying by automobile manufacturers. Deliveries have been reduced to two and three weeks for ordinary specifications. Mills are maintaining a high rate of operation. New contracts are being made at 1.95c., Pittsburgh, or 2.27c., delivered Philadelphia.

Shapes.—Mills have fair backlogs, but deliveries can be had in from one to two weeks, depending upon the specification. Prices are still irregular, ranging from 1.95c. to 2.05c. a lb., f.o.b. nearest mill to consumer, or 2.01c. to 2.11c. a lb., delivered Philadelphia.

Plates.—Third quarter contracting has been substantial, and, if consumers specify as freely as in the past quarter, continued operation at full capacity is expected. Railroads and car builders are providing substantial business. Quotations are unchanged at 2.05c., Coatesville, or 2.15c., delivered Philadelphia.

Sheets.—Although automobile body builders are not buying so freely as in the second quarter, blue annealed sheet prices are being maintained with No. 13 gage at 2.35c. a lb., Pittsburgh, or 2.67c., delivered Philadelphia, and light plates, blue annealed, at 2.20c., Pittsburgh, or 2.52c., Philadelphia for No. 10 gage. Large preferred buyers, such as automobile body builders, usually obtain concessions of $2 a ton or more. Shading of black and galvanized sheet prices is increasing, and sales have been made at 2.85c. to 2.90c. a lb., Pittsburgh, or 3.17c. to 3.22c., Philadelphia, for black and at 3.60c. to 3.65c., Pittsburgh, or 3.92c. to 3.97c., Philadelphia, for galvanized.

Warehouse Business.—June has compared favorably with May in the total of shipments from stock, but the latter part of the month brought a slight decline in business. Prices are well maintained.

Imports.—In the week ended June 29, arrivals of chrome ore at this port totaled 2855 tons, of which 2500 tons was from Portuguese Africa and 355 tons from British India. Imports of Algerian iron ore amounted to 6600 tons. Steel imports consisted of 346 tons of structural shapes, 52 tons of steel bars and 60 tons of steel bands from Belgium, 18 tons of steel rods from Germany, four tons of drill steel from Sweden and 24 tons of steel scrap from the United Kingdom.

Old Material.—No. 1 heavy melting steel is quotable at $16.50 per ton on the basis of recent purchases. The available supply of good No. 1 steel is said by dealers to be sufficient at the present level of prices, but efforts to buy at lower prices result in curtailment of the tonnage secured. Specification pipe has been bought by a Lebanon, Pa., consumer at $15 a ton, delivered, a decline in the price of 50c. a ton. The latest purchase of stove plate by a Harrisburg mill was at $12 a ton, delivered. On a recent sale of steel shafting the price was $19.50 a ton, and this was followed by further small sales at $19 a ton, delivered.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$16.50
Scrap T rails	16.00
No. 2 heavy melting steel	$12.50 to 14.00
No. 1 railroad wrought	16.00 to 16.50
Bundled sheets (for steel works)	11.50
Hydraulic compressed, new	14.50 to 15.00
Hydraulic compressed, old	12.00 to 12.50
Machine shop turnings (for steel works)	11.50
Heavy axle turnings (or equiv.)	14.00 to 14.50
Cast borings (for steel works and roll. mill)	11.00 to 11.50
Heavy breakable cast (for steel works)	15.00
Railroad grate bars	12.00 to 12.50
Stove plate (for steel works)	11.50 to 12.00
No. 1 low phos., hvy., 0.04% and under	22.00 to 23.00
Couplers and knuckles	20.00 to 21.00
Rolled steel wheels	20.00 to 21.00
No. 1 blast f'nace scrap	10.50 to 11.00
Wrot. iron and soft steel pipes and tubes (new specific.)	15.00
Shafting	19.00 to 19.50
Steel axles	23.00 to 23.50
No. 1 forge fire	14.00
Cast iron carwheels	16.00 to 16.50
No. 1 cast	16.50 to 17.00
Cast borings (for chem. plant)	14.50
Steel rails for rolling	16.50 to 17.00

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.70c.
Plates, ⅜-in.	2.90c.
Structural shapes	2.70c.
Soft steel bars, small shapes, iron bars (except bands)	2.80c.
Round-edge iron	3.50c.
Round-edge steel, iron finished 1½ x 1½ in.	3.50c.
Round-edge steel, planished	4.30c.
Reinforc. steel bars, sq. twisted and deform.	2.60c. to 2.80c.
Cold-fin. steel, rounds and hex.	3.60c.
Cold-fin. steel, sq. and flats	4.10c.
Steel hoops	3.55c.
Steel bands, No. 12 to ⅜-in. inclus.	3.30c.
Spring steel	5.00c.
*Black sheets (No. 24)	4.10c.
†Galvanized sheets (No. 24)	4.85c.
Light plates, blue annealed (No. 10)	3.25c.
Blue ann'l'd sheets (No. 13)	3.40c.
Diam. pat. floor plates—	
¼-in.	5.30c.
⅜-in.	5.50c.
Rails	3.20c.
Swedish iron bars	6.60c.

*For 50 bundles or more; 10 to 49 bun., 4.10c. base; 1 to 9 bun., 4.35c. base.
†For 50 bundles or more; 10 to 49 bun., 4.95c. base; 1 to 9 bun., 5.30c. base.

Chicago Steel Companies Object to Southwest Rates

Chicago district iron and steel interests, in cooperation with the Chicago Association of Commerce, have filed with Interstate Commerce Commission a brief against attempts by Eastern railroads to discriminate further against the Middle West in rates on iron and steel shipments to the Southwest. Suspension of proposed rates is asked pending further investigation.

The proposed lower tariffs, filed by the New York Central, Pennsylvania, Erie and Baltimore & Ohio, would establish new lower rail-water rates to Louisiana, Oklahoma, Texas and Arkansas from Wheeling, W. Va., and Cleveland, Canton and Youngstown, Ohio. These new schedules on shipments via steamship lines from North Atlantic ports to Gulf ports and the rail lines beyond would be, it is contended, on a lower basis than prescribed by the commission to cover all-rail routes from Chicago.

It is the contention of Chicago interests that no changes should be made in the present rail-water-rail adjustment to the Southwest until the commission decides the general case now pending and involving rates on all freight traffic between the East and Southwest.

Forecast Record Third Quarter in Motor Cars

Completing the greatest first half year of its history, the automotive industry enters the third quarter with every indication that business will continue at a high rate, says *Automotive Industries*, Philadelphia. Many motor car leaders who have made a careful analysis of the market predict that the third quarter will likewise set an all-time production mark when compared with the third quarter of other years. Sales leaders indicate that the demand for new cars is becoming well distributed throughout the country.

New car stocks, which were built up as a result of the record output, apparently reached the peak at the start of the spring selling season, and with a strong retail demand continuing, the number of cars in the field has been gradually reduced as the season progressed. However, there are more cars in the field now than there were a year ago. A large part of the increase can be attributed to Ford, whose stocks at the corresponding period last year were not a factor. Indications are that there is a slight increase in the number of new cars in the field other than Fords, but the increase is so close to the retail demand that the situation as a whole is not alarming.

As in former years, many manufacturers will start to reduce production during July. Manufacturers who are preparing new models for introduction will operate at a high production rate, which will have a tendency to stabilize the production figure of the industry as a whole on a high plane.

An attractive pamphlet of 32 pages has been issued by C. O. Bartlett & Snow Co., 6200 Harvard Avenue, Cleveland, entitled "The Foundry Book." It is designated Bulletin No. 63 and is elaborately illustrated. It describes various types of equipment for mechanically operated foundries, which, it is claimed, result in increased production and decreased costs. Foundry sand conditioning and mold conveying equipment predominates.

Pacific Coast

Steel Demand Continues Active—10,000 Tons of Plates Required for Pipe Line—Prices Steady

SAN FRANCISCO, June 29 (*By Air Mail*).—During the first half of the year awards of cast iron pipe, bars, plates and shapes, as reported each week in THE IRON AGE, exceeded or equalled the aggregate placed during the first half of 1928. A decided increase in the tonnage of plates and shapes booked to date this year was noted over the corresponding period of last year, the totals, as compiled from known projects, being 179,676 tons for the first half of this year and 87,075 tons for the same period a year ago.

Demand continues active. Important developments of the week included the award of 3570 tons of plates for oil storage tanks in Los Angeles and the placing of 4500 tons of shapes for the Shell Oil Building, San Francisco. Prices generally are holding firmly to levels established some time ago.

Pig Iron.—Foundry operations both in the bay district and in the southern part of the State have increased somewhat, and demand for foundry iron is improving. No large sales or inquiries are reported, but importers and dealers say that orders are more numerous. About 1300 tons of Indian iron has arrived on the Coast to be applied against contracts placed some time ago. Prices are unchanged.

Prices per gross ton at San Francisco:

*Utah basic	$25.00 to $26.00
*Utah fdy., sil. 2.75 to 3.25	25.00 to 26.00
**Indian fdy., sil. 2.75 to 3.25	25.00 to 26.00

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Bars.—During the first half of this year 42,100 tons of reinforcing steel bars was reported placed. This compares with 41,834 tons for the same period last year. The largest letting of the week was 2550 tons for the Cushman dam project at Tacoma, placed with an unnamed interest. A paving project in San Diego County, Cal., required 156 tons. Pending business is of fair proportions and includes 256 tons for a bridge over the Salinas River and 208 tons for paving in Alameda County, Cal. In the San Francisco district, 2.20c., base, applies on lots of 250 tons or more, 2.30c., on carload lots and 2.60c. on smaller tonnages. Merchant bar material continues unchanged at 2.35c., c.i.f., though demand is far from active, most sales and inquiries being limited to small lots.

Plates.—Interest this week centers in the call for bids for a 48-in. riveted steel pipe line for the Cedar River project in Seattle, involving 10,000 tons of plates. Bids on this work will be opened July 5. The Western Pipe & Steel Co. took 15 118,000-bbl. oil storage tanks, calling for 5370 tons, for the Texas Oil Co. This company also secured 400 tons for three gas holders for the Pacific Gas & Electric Co. at Hayward, Cal. Prices appear to be firm at 2.35c., c.i.f.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and struc. shapes	3.15c.
Soft steel bars	3.15c.
Small angles, ⅞-in. and over	3.15c.
Small angles, under ⅞-in.	3.55c.
Small channels and tees, ¾-in. to 2¾-in.	3.75c.
Spring steel, ¼-in. and thicker	5.00c.
Black sheets (No. 24)	4.90c.
Blue ann'l'd sheets (No. 10)	3.80c.
Galv. sheets (No. 24)	5.30c.
Struct. rivets, ½-in. and larger	5.65c.
Com. wire nails, base per keg	$3.40
Cement c't'd nails, 100 lb. keg	3.40

Shapes.—The largest structural award of the week went to the Moore Dry Dock Co. and called for 4500 tons for the Shell Oil Building, San Francisco. The McClintic-Marshall Co. took 850 tons for a Medical-Dental Building in Phoenix and 350 tons for a bridge in San Bernardino, Cal. An overhead crossing at Barstow, Cal., and a viaduct in Tacoma, Wash., were placed, involving 605 tons and 576 tons respectively. New inquiries include 252 tons for two bridges for the Pacific Electric Railway, Los Angeles, and 2700 tons for two hotels in San Francisco. Bids were opened on 630 tons for a bridge over the Salinas River in California. No change in quotations on plain structural shapes is noted, 2.35c., c.i.f., being firm.

Cast Iron Pipe.—The only award of over 100 tons reported this week called for 224 tons of 12-in. Class D pipe for the improvement of Westlake Avenue North, Seattle, Wash., and was placed with Argentieri & Colorossi. B. W. Kuhn was low bidder on 208 tons of 4-in. Class C pipe for the improvement of Coldwater Canyon Road, Los Angeles. The United States Pipe & Foundry Co. was low on 1425 tons of 8-in. Class B pipe for Los Angeles, and the Grinnell Co. was low on 1148 tons of 24-in. Class C pipe for the same city. San Diego, Cal., will open bids on July 8 for 145 tons of 4 to 12-in. Class B pipe. The East Bay Municipal Utility District, Oakland, will open bids on July 3 for 260 tons of 12-in. pipe. Santa Monica, Cal., will open bids on July 18 for 185 tons of 4 to 12-in. Class B pipe.

Coke.—About 5000 tons of English beehive and by-product foundry coke arrived on the Coast this week.

Boston

Pig Iron Prices Still Unsettled—Export Movement of Scrap Gains as Domestic Mills Hold Up Shipments

BOSTON, July 2.—The General Fire Extinguisher Co., Providence, R. I., last week failed to close on 2000 tons of No. 2X and No. 1X pig iron, and action on 2000 tons of three grades of iron wanted by the Chapman Valve Co., Springfield, Mass., has been deferred two weeks, while the General Electric Co. apparently is in no hurry to close on its Lynn and Everett, Mass., third quarter requirements. Consequently the price situation is still more or less unsettled. Sales the past week totaled about 6000 tons, and included 1000 tons for a General Electric Co. New Jersey plant and 750 tons for its Pittsfield, Mass., plant; a round tonnage of malleable for a Bridgeport, Conn., foundry; as well as several 200 and 300 ton lots to various companies. In addition to 2000 tons of No. 2X and No. 1X for Providence, the General Fire Extinguisher Co. will take 500 tons of malleable for its Toronto foundry. A Connecticut maker of fittings recently purchased 1200 tons of Buffalo malleable.

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars, small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tie steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold-rolled steel—	
Rounds and hex	*3.55c. to 5.55c.
Spares and flats	*4.05c. to 7.05c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.50c.

	Per Cent Off List
Machine bolts	50 and 5
Carriage bolts	50 and 5
Lag screws	50 and 5
Hot-pressed nuts	50 and 5
Cold-punched nuts	50 and 5
Stove bolts	70 and 10

*Including quantity differentials.

Foundry iron prices per gross ton deliv'd to most New England points:

*Buffalo, sil. 1.75 to 2.25	$22.41 to $23.41
*Buffalo, sil. 2.25 to 2.75	22.91 to 23.91
East. Penn., sil. 1.75 to 2.25	24.65
East. Penn., sil. 2.25 to 2.75	25.15
Va., sil. 1.75 to 2.25	25.21
Va., sil. 2.25 to 2.75	25.71
Ala., sil. 1.75 to 2.25	21.91 to 23.77
Ala., sil. 2.25 to 2.75	22.41 to 24.27

Freight rates: $4.91 all rail from Buffalo; $3.65 from eastern Pennsylvania; $5.21 all rail from Virginia; $6.91 to $8.77 from Alabama.

*All rail rate.

Reinforcing Bars.—Current sales of billet steel reinforcing bars are in small tonnages. Competition for business is keen, but sellers are holding to 2.66½c. a lb., base, from stock. The market for rail steel bars is quiet, with some withdrawals of prospective tonnages from the market. The open-

ly quoted price for such bars is 2.26½c. per lb., base, delivered common Boston freight rate points.

Cast Iron Pipe.—New Haven, Conn., is reported to have closed on 3000 tons of 42-in. pipe with an Eastern foundry. East Providence, R. I., has bought 120 tons of 6 and 8-in. pipe from the Warren Foundry & Pipe Co. Boston bought 396 ft. of 12 and 16-in. from R. D. Wood & Co. Hopkinton, Mass., closes bids July 9 on 1000 tons of pipe and fittings and will also buy pumping equipment, hydrants, valves and valve boxes. Woodsville, N. H., is about to purchase 1500 tons of 10 and 12-in. pipe, and Ossipee, N. H., will place a round tonnage of 6-in. Salem, Mass., closed bids July 2 on 100 tons of 6 and 8-in. pipe. The market for 4-in. pipe is firm at $47.10 a ton, delivered common Boston freight rate points, and 6 to 12-in. at $43.10, but that for 16 to 20-in. pipe is unsettled at $42.10. A $3 differential is asked on Class A and gas pipe.

Old Material.—The holding up of shipments by three or four Pennsylvania steel mills has slowed down the scrap market somewhat, but, owing to the scarcity of most materials, prices, with the exception of those for pipe, are holding firmly. Rails for rerolling are higher, and there is less of a spread in quotations for forge flashings. The falling off in business for domestic delivery is more than offset by increased activity in the export market. The steamer Emperor, which completed loading 2500 tons of scrap some time ago, last week sailed for Skeltin, Germany; another steamer with 1464 tons cleared June 27 for Danzig. Another steamer will arrive this week to load 3500 tons for Danzig, to be followed by one steamer to load 1500 tons, also for Danzig. Until last week all exports of scrap were by tramp steamers. Arrangement has been made with a regular line of steamers to export approximately 1500 tons monthly or fortnightly to Danzig, depending on the amount of material available.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$12.00 to $12.25
Scrap T rails	11.50 to 12.00
Scrap girder rails	10.50 to 11.25
No. 1 railroad wrought	12.00 to 12.50
No. 1 yard wrought	9.50 to 10.00
Machine shop turnings	6.50 to 6.60
Cast iron borings (steel works and rolling mill)	6.50 to 6.60
Bundled skeleton, long	9.50 to 10.25
Forge flashings	10.00 to 10.50
Blast furnace borings and turnings	6.00 to 6.25
Forge scrap	8.75 to 9.00
Shafting	14.00 to 14.25
Steel car axles	17.00 to 17.50
Wrought pipe 1 in. in diameter (over 2 ft. long)	9.75 to 10.00
Rails for rolling	12.50 to 12.75
Cast iron borings, chemical	10.00 to 10.25

Prices per gross ton deliv'd consumers' yards:

Textile cast	$14.50 to $14.75
No. 1 machinery cast	15.00 to 15.25
No. 2 machinery cast	13.00 to 13.25
Stove plate	11.50 to 12.00
Railroad malleable	18.50 to 19.00

Cincinnati

Pig Iron Consumers Slow to Cover Forward Requirements —Specialty Sheets in Good Demand

CINCINNATI, July 2.—Sales of pig iron in June were well up to the May level, but slightly below the usual end of the quarter volume. Except for a sale of 3000 tons of Northern iron to a southern Ohio melter for second half, orders were for small quantities for third quarter needs. Although Northern iron has been firm at about $18.50, base furnace, continued weakness of Southern iron and the reluctance of some consumers to cover for third quarter requirements have made dealers uneasy, giving the Northern market a slight undertone of softness. Shipments on current contracts in June also were about equal to the May volume, but the demand is expected to slump during July, when melters dispose of surpluses before the annual inventory period. A Michigan consumer is reported to have placed an order for 1000 tons of silvery.

Prices per gross ton, deliv'd Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25	$19.89 to $20.39
Ala. fdy., sil. 1.75 to 2.25	18.69 to 19.19
Ala. fdy., sil. 2.25 to 2.75	19.19
Tenn. fdy., sil. 1.75 to 2.25	19.19
S'th'n Ohio silvery, 8 per cent	27.89 to 28.89

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

Coke.—While the volume of new business for foundry coke during the past month slumped noticeably, specifications on current contracts have been better than in the preceding 30 days.

Finished Material.—A well sustained demand for specialty sheets, especially from electrical manufacturers and for metal furniture, is keeping district mills at capacity production. Following the annual shutdown during this month, the trade anticipates a demand for sheets equal to the capacity of mills. Production of cold-rolled strip is catching up with the demand as a result of a reduction in bookings from automobile manufacturers. Mills are now making deliveries on cold-rolled strip in four to six weeks.

Old Material.—Continued steadiness of prices of scrap iron and steel has brought the market into a firmer position. Shipments against contracts have been sustained, but new business has been in small lots for immediate use.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel	$13.00 to $13.50
Scrap rails for melting	13.75 to 14.25
Loose sheet clippings	9.25 to 9.75
Bundled sheets	10.50 to 11.00
Cast iron borings	9.00 to 9.25
Machine shop turnings	8.50 to 8.75
No. 1 busheling	10.50 to 11.00
No. 2 busheling	6.75 to 7.00
Rails for rolling	14.50 to 15.00
No. 1 locomotive tires	14.25 to 14.75
No. 2 railroad wrought	13.00 to 13.50
Short rails	18.50 to 19.00
Cast iron carwheels	12.75 to 13.25
No. 1 machinery cast	19.25 to 19.75
No. 1 railroad cast	15.25 to 15.75
Burnt cast	10.25 to 10.75
Stove plate	10.25 to 10.75
Brake shoes	10.25 to 10.75
Railroad malleable	15.25 to 15.75
Agricultural malleable	14.25 to 14.75

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and struc. shapes	3.40c.
Bars, soft steel or iron	3.30c.
New billet reinforc. bars	3.15c.
Rail steel reinforc. bars	3.00c.
Hoops	4.05c.
Bands	3.50c.
Cold-fin. rounds and hex.	3.85c.
Squares	4.35c.
Black sheets (No. 24)	4.05c.
Galvanized sheets (No. 24)	4.90c.
Blue ann'l'd sheets (No. 10)	3.45c.
Structural rivets	3.85c.
Small rivets	65 per cent off list
No. 9 ann'l'd wire, per 100 lb.	$3.00
Com. wire nails, base per keg	2.85
Cement c't'd nails, base 100 lb. keg	2.85
Chain per 100 lb.	8.75
	Net per 100 Ft.
Lap-weld steel boiler tubes, 2-in.	$16.00
4-in.	33.00
Seamless steel boiler tubes, 2-in.	17.00
4-in.	34.00

Canada

Third Quarter Buying of Pig Iron Gains

TORONTO, ONT., July 2.—New business has gained in the Canadian pig iron markets during the past week or 10 days. A number of large tonnage contracts have been placed. According to local blast furnace representatives, upward of 80 per cent of those who place contracts are now covered for third quarter. Others are coming forward, and it is expected that the majority will have booked up by the end of next week. In addition to those who have placed orders for the entire quarter, a number of melters have made known their requirements for the next six weeks. While forward buying has been active, sales on spot account have slumped. Canadian pig iron prices continue firm. Producers have again introduced the 50c. differential on No. 1 over No. 2 foundry iron, with No. 1 now quoted at $24.60 and No. 2, $24.10, Toronto.

Prices per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	$24.60
No. 2 fdy., sil. 1.75 to 2.25	24.10
Malleable	24.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	$26.00
No. 2 fdy., sil. 1.75 to 2.25	25.50
Malleable	26.00
Basic	24.50
Imported Iron, Montreal Warehouse	
Summerlee	$33.50
Carron	33.00

Structural Steel.—While the demand for structural steel continues steady and in large total volume, new orders for the week were chiefly confined to lots under 1000 tons. Building activities throughout Canada are brisk and large tonnages of steel are on order. The steel work on the new Canadian Bank of Commerce Build-

ing at Toronto, involving 15,000 tons, will be started almost immediately. Several other large structures are in prospect, and it is estimated that projects to be closed within the next month or six weeks exceed 30,000 tons.

Old Material.—The demand is comparatively small, with new business mostly confined to spot orders. Forward buying is at a standstill. The demand for heavy melting steel and turnings in the Montreal district is on the decline. Iron scrap grades continue to move in fair volume. Prices are firm but unchanged.

Dealers' buying prices:

	Per Gross Ton	
	Toronto	Montreal
Heavy melting steel.	$10.00	$8.50
Rails, scrap	11.00	9.00
No. 1 wrought	10.00	12.00
Machine shop turnings	7.50	5.00
Boiler plate	7.50	6.00
Heavy axle turnings	8.00	7.50
Cast borings	7.50	5.00
Steel turnings	7.50	6.50
Wrought pipe	6.00	6.00
Steel axles	15.00	20.00
Axles, wrought iron	17.00	22.00
No. 1 machinery cast	....	17.00
Stove plate	....	13.00
Standard carwheels	....	16.00
Malleable	....	13.00
	Per Net Ton	
No. 1 mach'ry cast	$16.00	....
Stove plate	12.00	....
Standard carwheels	15.00	....
Malleable scrap	14.00	....

Youngstown

Some Mill Shutdowns for Holiday and Repairs

YOUNGSTOWN, July 2.—Mill schedules for the first week in July are interrupted by suspensions for holiday observance. Mill managers will take advantage of the lull to make repairs to rolling mill equipment. Sheet mills, for the most part, will suspend Wednesday afternoon for remainder of the week. Of 120 sheet mills in the Mahoning Valley, 106 started rolling on Monday.

Strip mills, on the other hand, will suspend for Thursday only and will start again Friday morning. Of the 20 pipe mills in the Valley, 13 started the week and will stop for the Fourth only. Tube mill operations are much better than early in the spring, with an improved outlook for the next few months.

Blast furnace schedules are reduced, owing to the blowing out of No. 4 stack in the Ohio Works group of the Carnegie Steel Co. for relining, leaving 30 of 34 blast furnaces in this area in action.

Independent tin mills suspend for the week in this district. The A. M. Byers Co. likewise suspends its puddle mill operations at the Girard works down for the full week.

The Youngstown Sheet & Tube Co. and the Republic Iron & Steel Co. are maintaining production at between 80 and 90 per cent, with the Carnegie Steel Co. averaging from 85 to 88 per cent.

St. Louis

Southern Price Reduction Stops Pig Iron Buying Movement—Steel Operations Continue Virtually at Capacity

ST. LOUIS, July 2.—The price reduction of 50c. a ton on Southern iron had the effect of abruptly ending a buying movement which began in the preceding week. Melters are now holding off on placing their requirements for third quarter. A leading Southern maker sold 750 tons to various melters at the reduced price. The Granite City maker sold only about 2500 tons, including 1000 tons to a jobbing foundry in Illinois, 800 tons to an implement manufacturer and 450 tons of malleable to a Tennessee melter. Shipments of the Granite City maker for the first 26 days in June averaged 1126 tons daily, compared with 1115 daily in the same period in May.

Finished Iron and Steel.—All departments of the Granite City Steel Co. are being operated at capacity, with the exception of tin plate, on which the rate is 85 to 90 per cent. While the company's specifications for June were not quite as heavy as in May, they were equal to shipments. Demand for galvanized sheets continues good, and this item is expected to show strength during the third quarter. Business in structural steel expected as a result of the settlement of the building strike has not materialized. The Laclede Steel Co. got an order for 300 tons of rail steel reinforcing bars for the Kirkwood Hotel, Des Moines, Iowa. The only pending project is 500 tons of reinforcing bars for a building for Kenrick Seminary, near here.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	$20.00
Malleable, f.o.b. Granite City	20.50
N'th'n No. 2 fdy., deliv'd St. Louis	22.16
Southern No. 2 fdy., deliv'd	19.42
Northern malleable, deliv'd	22.16
Northern basic, deliv'd	22.16

Freight rates: 75c. (average) Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

Old Material.—The market for old materials is dull. Dealers complain of a scarcity of material. There is very little coming in from Southern dealers because of hot weather. Railroad lists are light. Consumers are buying, but dealers are unwilling to sell any considerable tonnages at prevailing prices. Railroad lists: Pennsylvania, 46,892 tons; Union Pacific, 2500 tons; Big Four Lines, 1100 tons; Missouri Pacific, 100 carloads; Mobile & Ohio, 26 carloads; Nickel Plate, 32 carloads; Frisco, 14 carloads; Nashville, Chattanooga & St. Louis, 10 carloads.

Dealers' buying prices per gross ton, f.o.b. St. Louis district:

No. 1 heavy melting or shoveling steel	$13.50 to $14.00
No. 2 heavy melting or shoveling steel	12.75 to 13.25
No. 1 locomotive tires	15.00 to 15.50
Miscel. stand.-sec. rails including frogs, switches and guards, cut apart	15.50 to 16.00
Railroad springs	17.00 to 17.50
Bundled sheets	9.50 to 10.00
No. 2 railroad wrought	13.50 to 14.00
No. 1 busheling	10.00 to 10.50
Cast iron borings and shoveling turnings	9.50 to 10.00
Iron rails	15.00 to 15.50
Rails for rolling	16.00 to 16.50
Machine shop turnings	8.00 to 8.50
Heavy turnings	9.75 to 10.00
Steel car axles	19.00 to 19.50
Iron car axles	26.50 to 27.00
Wrot. iron bars and trans.	22.00 to 22.50
No. 1 railroad wrought	13.00 to 13.50
Steel rails, less than 3 ft.	17.50 to 18.00
Steel angle bars	14.25 to 14.75
Cast iron carwheels	14.25 to 14.75
No. 1 machinery cast	15.50 to 16.00
Railroad malleable	15.50 to 16.00
No. 1 railroad cast	15.00 to 15.50
Stove plate	11.50 to 12.00
Agricult. malleable	15.00 to 15.50
Relay. rails, 60 lb. and under	20.50 to 23.50
Relay. rails, 70 lb. and over	26.50 to 29.00

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-fin. rounds, shafting, screw stock	3.75c.
Black sheets (No. 24)	4.25c.
Galv. sheets (No. 24)	5.10c.
Blue ann'l'd sheets (No. 10)	3.45c.
Black corrug. sheets (No. 24)	4.30c.
Galv. corrug. sheets	5.15c.
Structural rivets	3.95c.
Boiler rivets	3.95c.
	Per Cent Off List
Tank rivets, ⅞-in. and smaller, 100 lb. or more	65
Less than 100 lb.	60
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50

Detroit Scrap Unchanged

DETROIT, July 2.—There have been no price changes on scrap in this district during the past week. Due to change of models in the automotive industry and the holiday this week, production of old material for the month will probably show 10 to 15 per cent decline, as compared with last month.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Hvy. melting and shov. steel	$13.75 to $14.25
Borings and short turnings	9.00 to 9.50
Long turnings	7.50 to 8.00
No. 1 machinery cast	12.50 to 13.00
Automobile cast	13.00 to 13.50
Hydraul. comp. sheets	13.50 to 14.00
Stove plate	9.00 to 9.50
New No. 1 busheling	12.00 to 12.50
Old No. 1 busheling	11.00 to 11.50
Sheet clippings	8.50 to 9.00
Flashings	12.50 to 13.00

A. M. Byers Co., Pittsburgh, has awarded a contract for design and construction of two special open-hearth tilting slag melting furnaces, for use at its new Ambridge, Pa., plant, to S. R. Smythe Co., Inc., Oliver Building, Pittsburgh.

Birmingham

Pig Iron Inquiries Increase—Light Shrinkage in Some Steel Orders Offset by Gains Elsewhere

BIRMINGHAM, July 2.—Pig iron buying has been on a conservative basis in the 10-day period since books were opened for the third quarter at the base price of $15. Orders have been in moderate lots. The principal development during the past week was a marked increase in inquiries. Several open inquiries involving large tonnages are reported. Negotiations are under way for important tonnages for outside points. Shipments continue in about the same volume, though foundries are working on small stocks. Of the 17 furnaces in blast, nine are on foundry, seven on basic and one on recarburizing iron.

Prices per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil.	$15.00
No. 1 fdy., 2.25 to 2.75 sil.	15.50
Basic	15.00

Finished Steel.—A light shrinkage in orders in some lines is being offset by increases in others. Sheet bookings are beginning to gain with the approach of the regular mid-summer buying period. The Tennessee company has received an order from the Southern Pacific Railroad for 13,168 tons of rails, and inquiries are still numerous. Improvement is reported in railroad accessory buying. Mill operations in the district continue at the same high rate as in June. Several fabricated structural steel orders in lots less than 400 tons have been received. The Ingalls Iron Works Co. has booked an order for 350 tons for the S. H. Kress Co. store at Montgomery, Ala. New orders of the Virginia Bridge & Iron Co. include 300 tons for addition to the Pepperell Mfg. Co. plant at Opelika, Ala.; 120 tons for plant of Cadet Knitting Mills at Columbia, Tenn., and 150 tons for highway bridges in Winston County, Ala. Reinforcing bar demand is up to the average of recent weeks. Twenty-two open hearths are active, the same as a week ago.

Cast Iron Pipe.—A normal run of small orders, interspersed with a few round tonnages from distant points, maintained backlogs through late June. The American Cast Iron Pipe Co. booked an order for about 2200 tons for Los Angeles and shared in the Philippine tonnage to the extent of 4500 tons. Contracts have not been announced on the 6650 tons for New Orleans, for which bids were opened last week. Griffin, Ga., has asked for bids on 1000 tons of 16 to 20-in. pipe. A project at Hollywood, Fla., requiring about 700 tons, has been postponed until July 15. A new order of the United States Pipe & Foundry Co. calls for 3670 ft. of 16-in. and 5810 ft. of 12-in. pipe for Macon, Ga. The base prices of $37 to $38 are unchanged.

Coke.—Nearly all contract buyers have renewed their contracts for third and fourth quarter requirements, and the market is again on a spot basis. Production by merchant ovens is steady at near capacity rates. Prices remain at $5, base.

Old Material.—Stove plate is being quoted at $11.50 to $12, a reduction of $1.50 from the price of the past several weeks. A reduction of 50c. a ton has been made on No. 1 cast, cast iron car wheels and scrap steel rails. Other prices are the same. New business continues at the slow rate that made the June total the lowest for any month of the year.

Prices per gross ton, deliv'd Birmingham dist. consumers' yards:

Heavy melting steel	$12.50
Scrap steel rails	12.50
Short shoveling turnings	9.00
Cast iron borings	9.00
Stove plate	$11.50 to 12.00
Steel axles	21.00
Iron axles	23.00
No. 1 railroad wrought	$10.00 to 10.50
Rails for rolling	14.00 to 15.00
No. 1 cast	13.50
Tramcar wheels	13.00
Cast iron carwheels	12.50 to 13.00
Cast iron borings, chem.	13.50 to 14.00

Buffalo

Pig Iron Market More Active—Steel Operations Show No Falling Off—Scrap Quiet

BUFFALO, July 2.—The pig iron market shows a little more activity. A New York State melter is inquiring for 1500 tons of foundry and malleable, and a radiator manfacturer is seeking 500 to 1000 tons of foundry. A New England company is in the market for 2000 tons of foundry and there are miscellaneous inquiries for 200, 250 and 500 tons. The price in the district is firm at $19.50, base. All of the furnaces have good backlogs.

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and struc. shapes	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.95c.
Cold-fin. flats, sq. and hex.	4.45c.
Rounds	3.95c.
Cold-rolled strip steel	5.85c.
Black sheets (No. 24)	4.20c.
Galv. sheets (No. 24)	4.85c.
Blue ann'l'd sheets (No. 10)	3.50c.
Com. wire nails, base per keg	$3.60
Black wire, base per 100 lb.	3.75

Prices per gross ton, f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25	$19.50
No. 2X fdy., sil. 2.25 to 2.75	20.00
No. 1 fdy., sil. 2.75 to 3.25	21.00
Malleable, sil. up to 2.25	20.00
Basic	18.50
Lake Superior charcoal	27.28

Finished Iron and Steel.—Operations at Buffalo mills show no falling off. Prices are firm and demand is good. Lackawanna, N. Y., will buy 400 tons of structural steel for the Ridge Road bridge. A new elevator will require 400 tons of reinforcing bars. Warehouse business has been very good, particularly in sheets.

Old Material.—A small quantity of No. 1 heavy melting steel was bought at $17.25, but this seems to have been the only outstanding transaction in the past week. No. 1 cast and stove plate are both easier, one of the largest consumers here being idle at present. Consumption of other grades of scrap is holding up very well. Quite a tonnage of No. 2 steel which would ordinarily come to Buffalo has gone to Valley points because of the strong market there. Weirton is offering $16.50.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$17.00 to $17.25
No. 2 heavy melting steel	14.75 to 15.00
Scrap rails	16.50 to 17.00
Hydraul. comp. sheets	14.50 to 14.75
Hand bundled sheets	12.00 to 12.50
Drop forge flashings	14.75 to 15.00
No. 1 busheling	15.50 to 16.50
Hvy. steel axle turnings	14.00 to 14.50
Machine shop turnings	7.50 to 7.75
No. 1 railroad wrought	13.00 to 13.50
Acid Open-Hearth	
Knuckles and couplers	19.00
Coil and leaf springs	19.00
Rolled steel wheels	19.00
Low phos. billet and bloom ends	20.00 to 20.50
Electric Furnace Grades	
Short shov. steel turnings	12.00 to 12.50
Blast Furnace Grades	
Short mixed borings and turnings	11.00 to 11.50
Cast iron borings	11.00 to 11.50
No. 2 busheling	10.00 to 10.50
Rolling Mill Grades	
Steel car axles	18.75 to 19.25
Iron axles	21.00 to 22.00
Cupola Grades	
No. 1 machinery cast	16.00 to 17.00
Stove plate	12.50 to 13.00
Locomotive grate bars	12.50 to 13.00
Steel rails, 3 ft. and under	19.00 to 19.50
Cast iron carwheels	14.00 to 14.50
Malleable Grades	
Industrial	18.50 to 19.00
Railroad	18.50 to 19.00
Agricultural	18.50 to 19.00
Special Grades	
Chemical borings	12.50 to 13.50

Curtiss, Wright, Keystone Aviation Companies Merge

A merger of the Curtiss Aeroplane & Motor Co., the Wright Aeronautical Corporation and the Keystone Aircraft Co. has been announced. A holding company which will be known as the Curtiss-Wright Corporation, with assets of more than $70,000,000, has been formed to take over the various properties.

Richard F. Hoyt, vice-president of the banking house of Hayden, Stone & Co., New York, and chairman of the Wright Aeronautical Corporation, will be chairman of the board of the new company and C. M. Keys, head of the Curtiss Company, will be president.

Fabricated Structural Steel

Fresh Inquiries, Totaling 37,000 Tons, Largest in Past Month—Awards Aggregate 42,000 Tons

FRESH inquiries for structural steel, totaling about 37,000 tons, were the largest since early in June. Among new projects which appeared during the past week were the Cedar River pipe line at Seattle, Wash., calling for 10,000 tons of plates, and a subway section in Brooklyn requiring 9500 tons. A building for the New York Telephone Co. on West Fiftieth Street, New York, will take 4000 tons. Awards, aggregating more than 42,000 tons, were considerably less than in the previous week. The largest contract consisted of 5370 tons of plates for 15 tanks for the Texas Co. at Los Angeles, Cal. Other major transactions were 4500 tons for an office building at San Francisco, 4000 tons for a bank building at Toledo, Ohio, and 3000 tons for a bridge at Peoria, Ill. Awards follow:

BANGOR & AROOSTOOK RAILROAD, 550 tons, five bridges, to Bethlehem Steel Co.

BOSTON & MAINE RAILROAD, 200 tons, bridge at Lawrence, Mass., to Boston Bridge Works, Inc.

BOSTON, Hyde Park district, 120 tons, Edison Electric Illuminating Co. garage and store room, to unnamed fabricator.

NORTH ADAMS, MASS., 100 tons, James Hunter Machine Co. addition, to Haarmann Steel Co.

STATE OF NEW YORK, 275 tons, highway bridges at Esperance, to McClintic-Marshall Co.

STATE OF NEW YORK, 270 tons, two highway bridges, to American Bridge Co.

NEW YORK, 350 tons, garage on West Sixty-sixth Street, to Easton Structural Steel Co.

HAMILTON, N. Y., 550 tons, chemistry building and chapter house, to Utica Steam Engine & Boiler Works.

STATE COLLEGE, PA., 720 tons, main building for Pennsylvania State College, to Anthracite Bridge Co.

PHILADELPHIA, 800 tons, factory for Proctor & Schwartz, to Shoemaker Bridge Co.

PHILADELPHIA, 740 tons, building for Bank of Philadelphia & Trust Co., to American Fabricators, Inc.

BALTIMORE, 1000 tons, office building for Curtiss-Caproni Corporation, to McClintic-Marshall Co.

MONTGOMERY, ALA., 350 tons, S. H. Kress Co. store, to Ingalls Iron Works.

WINSTON COUNTY, ALA., 150 tons, highway bridges, to Virginia Bridge & Iron Co.

COLUMBIA, TENN., 120 tons, plant of Cadet Knitting Mills, to Virginia Bridge & Iron Co.

BUTLER, PA., 100 tons, bank building, to Guibert Steel Co.

LEECHBURG, PA., 100 tons, bank building, to Guibert Steel Co.

NEW KENSINGTON, PA., 1300 tons, Aluminum Co. of America, to McClintic-Marshall Co.

BUFFALO, 125 tons, National Aniline & Chemical Co., to Lackawanna Steel Co.

GUELPH, ONT., 150 tons, horticultural building for Ontario Agricultural College, to London Structural Steel Co.

LIVERPOOL, N. S., 100 tons for Mersey Power Co., to Dominion Bridge Co.

PERE MARQUETTE RAILROAD, 350 tons, two bridges in Michigan, to American Bridge Co.

FLINT, MICH., 825 tons, addition for Chevrolet Motor Co., to R. C. Mahon.

FLINT, 2400 tons, freight loading equipment for Chevrolet Motor Co. to Whitehead & Kales Co.

GRAND RAPIDS, MICH., 800 tons, school, to Russell Steel Construction Co.

TOLEDO, 4000 tons, Ohio Savings Bank & Trust Co. building, to American Bridge Co.

TOLEDO, 450 tons, Edward Ford Plate Glass Co., to McClintic-Marshall Co.

CHESAPEAKE & OHIO RAILROAD, 250 tons, bridges at Miami, Ohio, to Bethlehem Steel Co.

STATE OF INDIANA, 600 tons, building for Automobile Specialties Mfg. Co., to Indiana Bridge Co.

BALTIMORE & OHIO, 185 tons, bridge in Chicago, to McClintic-Marshall Co.

CHICAGO, 500 tons, Thompson-Starrett Building, to American Bridge Co.

CHICAGO, 500 tons, Hoops Building, to American Bridge Co.

CHICAGO, 1000 tons, garage on Plymouth Court, to unnamed bidder.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC, 550 tons, girder spans and track scales, to American Bridge Co.

CHICAGO, 300 tons, addition to Continental Illinois Co. building, to American Bridge Co.

PEORIA, ILL., 3000 tons, bridge, to McClintic-Marshall Co.

MILWAUKEE, 2500 tons, Milwaukee Gas Light Co. building, to Worden-Allen Co.

MILWAUKEE, 400 tons, addition to Cold Spring shops, Milwaukee Electric Railway & Light Co., to Worden-Allen Co.

SOUTH MILWAUKEE, WIS., 200 tons, locomotive shop for Bucyrus-Erie Co., to Worden-Allen Co.

TWO RIVERS, WIS., 400 tons, warehouse for Aluminum Goods Mfg. Co., to Worden-Allen Co.

UNION PACIFIC RAILROAD, 1000 tons, train shed, to Milwaukee Bridge Co.

WEYBURN, SASK., 500 tons, hospital building for Department of Public Works, Regina, to Dominion Bridge Co.

PHOENIX, ARIZ., 850 tons, Medical-Dental Building, to McClintic-Marshall Co.

LOS ANGELES, 5370 tons plates, 15 118,000-bbl. tanks for Texas Oil Co., to Western Pipe & Steel Co.

SAN BERNARDINO, CAL., 350 tons, bridge on La Cadena Street, to McClintic-Marshall Co.

HAYWARD, CAL., 400 tons plates, one 100,000 and two 200,000-cu. ft. gas holders for Pacific Gas & Electric Co., to Western Pipe & Steel Co.

SAN FRANCISCO, 4500 tons, Shell Oil Co. building, to Moore Dry Dock Co.

SACRAMENTO, CAL., 605 tons, overhead crossing at Barstow, to unnamed bidder.

WENATCHEE, WASH., 133 tons, re-decking bridge over Columbia River, to unnamed bidder.

OLYMPIA, WASH., 576 tons, viaduct in Tacoma, to unnamed bidder.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

SALEM, MASS., 300 tons, theater.

BOSTON, 200 tons, River Street bridge.

STATE OF VERMONT, 190 tons, bridges at Jamaica and Warren.

SPRINGFIELD, MASS., 175 tons, high school.

STATE OF NEW HAMPSHIRE, 100 tons, two bridges.

NEW YORK, 4000 tons, building on West Fiftieth Street for New York Telephone Co.

NEW YORK, 6000 tons, office building, Fifty-eighth Street and Fifth Avenue; bids in.

NEW YORK, 3900 tons, additional roadway on Queensborough Bridge; Bersin & Romm, New York, low bidder on second opening.

NEW YORK CENTRAL RAILROAD, 1725 tons, viaduct at 241st Street station; bids in.

PORT CHESTER, N. Y., 400 tons, building for United Hospital; bids in.

BROOKLYN, 9500 tons, subway section; Di Marco & Reimann, New York, general contractor.

STATE OF NEW JERSEY, 5450 tons, bridge over Hackensack River; Strobel Steel Construction Co., Chicago, low bidder on general contract.

STATE OF PENNSYLVANIA, 500 tons, three highway bridges; bids in.

STATE OF PENNSYLVANIA, 350 tons, highway bridge in Luzerne County; Anthracite Bridge Co., low bidder.

PHILADELPHIA, 2850 tons, Ridge Avenue section of subway; bids opened July 19.

DELAWARE, LACKAWANNA & WESTERN RAILROAD, 4000 tons, catenary supports; American Bridge Co., low bidder.

HAMILTON, ONT., 300 tons, secondary school for Board of Education.

LACKAWANNA, N. Y., 400 tons; Ridge Road bridge.

CLEVELAND, 110 tons, building for Energine Refining & Mfg. Co.

CLEVELAND, 200 tons, addition for Reliance Electric & Engineering Co.

MILWAUKEE, 2750 tons, addition to Northwestern Mutual Life office building; Holabird & Roche, Chicago, architects.

MADISON, WIS., 800 tons, bids rejected on field house for University of Wisconsin.

CHICAGO, 600 tons, Ruth automatic garage.

CHICAGO, 800 tons, Blackstone Gift Shop.

CHICAGO, 3600 tons, John R. Thompson Co. building.

BELLEVILLE, ILL., 500 tons, hotel.

SEATTLE, 10,000 tons plates, Cedar River pipe line 48-in. riveted steel; bids July 5.

SACRAMENTO, CAL., 630 tons, bridge over Salinas River; bids opened.

LOS ANGELES, 126 tons, bridge over Los Angeles River for Pacific Electric Railway Co.; bids being taken.

LOS ANGELES, 126 tons, bridge over Tujunga Wash for Pacific Electric Railway Co.; bids being taken.

Illinois Steel Co. to Expand

The United States Steel Corporation has decided to expand the capacity of the Illinois Steel Co., Chicago, in its open-hearth, plate mill and structural mill departments. Details have not yet been fully determined.

The Chicago Steel & Wire Co. has organized a subsidiary, the Fusion Welding Corporation, to sell all the welding rods manufactured by the parent company. Home offices are in Chicago and ten branches have been established. The new corporation will also handle Fuzon welding equipment and accessories.

Non-Ferrous Metal Markets

Copper Quiet But Firm, Tin Inactive, Sales of Lead and Zinc Light, Prices Unchanged

NEW YORK, July 2.

None of the markets is active because of the approaching holiday, but all quotations are firm.

Copper.—Late last week there was a spurt in demand from foreign consumers. On one day sales amounted to 3000 tons and they were fairly large on one or two other days. Since then export demand has fallen off. Domestic consumers continue to buy only what is absolutely necessary. They are well covered through July, and it is evident that they will not purchase August and future requirements until necessary. Foreign consumers are evidently overbought because they did not come into the market for the expected June consumption. As a result, the market in general continues very quiet. Quotations are decidedly firm at the levels that have prevailed for over two months. Electrolytic copper is quoted at 18c., delivered in the Connecticut Valley, with the price of Copper Exporters, Inc., at 18.30c., c.i.f. usual European ports. Present needs are still being met by custom smelters, primary producers being still out of the market. A heavy demand may develop almost any day because foreign consumers must buy considerable metal for July and August, and domestic consumers must cover for future requirements. Some feel that there is danger in this situation in that too large a demand may advance prices. Lake copper is quiet and steady at 18c. to 18.12½c., delivered.

Copper Averages.—The average price of Lake copper for June, based on daily quotations in THE IRON AGE, is 18.12½c., delivered, New York. The average price of electrolytic copper is 17.75c., refinery, or 18c., delivered in the Connecticut Valley.

Tin.—Sales of Straits tin were just under 1000 tons for the week ended Saturday, June 29. Demand is light, and there is practically none for distant futures. Spot tin, because it is plentiful, is selling at a discount, and most of the orders are for spot delivery. Partial statistics, just issued for June, show a decrease in the world's visible supply of 1016 tons. The "London group" continues its purchases and its attempts to support the market, but it has made little progress in advancing prices to 57.50c., as "a stabilized level." The market here today was decidedly in-

THE WEEK'S PRICES, CENTS PER POUND FOR EARLY DELIVERY

	July 2	July 1	June 29	June 28	June 27	June 26
Lake copper, New York	18.12½	18.12½	18.12½	18.12½	18.12½	18.12½
Electrolytic copper, N. Y.*	17.75	17.75	17.75	17.75	17.75	17.75
Straits tin, spot, N. Y.	44.62½	44.62½	....	44.50	44.37½	44.37½
Zinc, East St. Louis	6.70	6.70	6.70	6.70	6.70	6.70
Zinc, New York	7.05	7.05	7.05	7.05	7.05	7.05
Lead, St. Louis	6.80	6.80	6.80	6.80	6.80	6.80
Lead, New York	7.00	7.00	7.00	7.00	7.00	7.00

*Refinery quotation; price ¼c. higher delivered in the Connecticut Valley.

Rolled Products

Prices on rolled non-ferrous products are unchanged from those prevailing one week ago.

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—
- High brass 23.25c
- Copper, hot rolled ..... 26.75c.
- Zinc ..... 10.25c.
- Lead (full sheets) ... 11.00c. to 11.25c.

Seamless Tubes—
- High brass ..... 28.25c.
- Copper ..... 29.25c.

Rods—
- High brass ..... 21.25c.
- Naval brass ..... 24.00c.

Wire—
- Copper ..... 19.87½c.
- High brass ..... 23.75c.

Copper in Rolls ..... 26.75c.
Brazed Brass Tubing ..... 30.87½c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also to St. Louis on shipments to points west of that river.

- Sheets, 0 to 10 gage, 3 to 30 in. wide ..... 33.00c.
- Tubes, base ..... 42.00c.
- Machine rods ..... 34.00c.

Chicago Warehouse

(Prices Cover Trucking to Customers' Doors in City Limits)

Sheets—	Base per Lb.
High brass	23.25c.
Copper, hot rolled	27.75c.
Copper, cold rolled, 14 oz. and heavier	30.00c.
Zinc	10.00c.
Lead, wide	11.90c.
Seamless Tubes—	
Brass	28.25c.
Copper	29.25c.
Brass Rods	21.25c.
Brazed Brass Tubes	31.00c.

New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

Sheets—	
High brass	21.12½c. to 22.12½c.
Copper, hot rolled, base sizes	27.75c. to 28.75c.
Copper, cold rolled 14 oz. and heavier, base sizes	30.00c. to 31.00c.
Seamless Tubes—	
Brass	26.00c. to 27.00c.
Copper	29.12½c. to 30.12½c.
Brazed Brass Tubes	29.12½c. to 30.12½c.
Brass Rods	18.87½c. to 19.87½c.

New York Warehouse

Delivered Prices, Base Per Lb.

- *Zinc sheets (No. 9), casks* ..... 10.50c. to 11.00c.
- *Zinc sheets, open* ..... 11.50c. to 12.00c.

Metals from New York Warehouse

Delivered Prices, Per Lb.

- Tin, Straits pig ..... 46.50c. to 47.50c.
- Tin, bar ..... 48.50c. to 49.50c.
- Copper, Lake ..... 19.50c.
- Copper, electrolytic ..... 19.25c.
- Copper, casting ..... 19.00c.
- Zinc, slab ..... 7.75c. to 8.25c.
- Lead, American pig ..... 7.75c. to 8.25c.
- Lead, bar ..... 9.75c. to 10.25c.
- Antimony, Asiatic ..... 10.50c. to 11.00c.
- Aluminum No. 1 ingots for remelting (guaranteed over 99% pure) ..... 25.00c. to 26.00c.
- Alum. ingots, No. 12 alloy, 24.00c. to 25.00c.
- Babbitt metal, commercial grade, 30.00c. to 40.00c.
- Solder, ½ and ½ ..... 30.00c. to 31.00c.

Metals from Cleveland Warehouse

Delivered Prices Per Lb.

- Tin, Straits pig ..... 49.63c.
- Tin, bar ..... 51.63c.
- Copper, Lake ..... 19.50c.
- Copper, electrolytic ..... 19.25c.
- Copper, casting ..... 18.75c.
- Zinc, slab ..... 7.75c. to 8.00c.
- Lead, American pig ..... 7.75c. to 8.00c.
- Lead, bar ..... 10.00c.
- Antimony, Asiatic ..... 16.00c.
- Babbitt metal, medium grade ..... 19.00c.
- Babbitt metal, high grade ..... 53.75c.
- Solder, ½ and ½ ..... 31.25c.

Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged customers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	14.50c.	16.00c.
Copper, hvy. and wire	14.25c.	15.625c.
Copper, light and bottoms	12.50c.	13.50c.
Brass, heavy	8.50c.	9.50c.
Brass, light	7.50c.	8.50c.
Hvy. machine composition	11.50c.	12.75c.
No. 1 yel. brass turnings	9.25c.	10.00c.
No. 1 red brass or compos. turnings	11.25c.	12.25c.
Lead, heavy	5.50c.	6.00c.
Lead, tea	4.50c.	5.50c.
Zinc	3.50c.	4.25c.
Sheet aluminum	14.00c.	16.00c.
Cast aluminum	12.25c.	14.25c.

active, with spot Straits tin quoted at 44.62½c., New York. Prices in London today were a little higher than a week ago, with spot standard quoted at £201 15s., future standard at £205 and spot Straits at £205 10s. The Singapore market today is £208.

Lead.—Prices continue unchanged and firm at 6.80c., St. Louis, and 7c., New York, the latter being the contract quotation of the leading interest. Consumers are limiting their inquiries and purchases to cover carload lots for immediate needs. The order books of producers are comfortably filled, and there is no need to press sales.

Zinc.—Prime Western zinc, which has developed considerable firmness in recent weeks, continues steady, though demand could be considerably better. Such sales as are made are mostly at 6.70c., East St. Louis, though some factors which were at this level a week ago are asking 6.75c., and one or two others have made sales at 6.80c. The tendency continues upward. Ore prices were again unchanged last week at $44, Joplin. Output was large at about 13,000 tons, and shipments nearly equaled this at 12,856 tons, the largest since April. Surplus stocks of ore are estimated at about 37,100 tons at the end of June, compared with about 34,000 tons at the end of May and with about 20,800 tons at the end of April.

Antimony.—There has been practically no change in demand or prices, and Chinese metal is still quoted at 8.75c., New York, duty paid, for all positions.

Nickel.—Ingot nickel in wholesale lots is quoted at 35c. per lb., with shot nickel at 36c. and cathodes of electrolytic nickel at 35c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is obtainable at the published price of 23.90c. per lb., delivered.

Non-Ferrous Metals at Chicago

CHICAGO, July 2.—Prices for copper are higher while quotations for antimony are lower. New buying is spotty and shipments against old orders are lighter. The old metal market is quiet.

Prices per lb., in carload lots: Lake copper, 18.50c.; tin, 45.62½c.; lead, 6.90c.; zinc, 6.80c.; in less-than-carload lots: antimony, 9.75c. On old metals we quote copper wire, crucible shapes and copper clips, 14c.; copper bottoms, 11.50c.; red brass, 11.50c.; yellow brass, 8c.; lead pipe, 4.50c.; zinc, 3.25c.; pewter, No. 1, 24.50c.; tin foil, 26c.; block tin, 36c.; aluminum, 12.87½c.; all being dealers' prices for less-than-carload lots.

Reinforcing Steel

Awards of 5600 Tons — New Projects Smallest in Weeks

MORE than two-thirds of the total tonnage booked in the past week went into two jobs. The Cushman project at Tacoma, Wash., will require 2550 tons of reinforcing bars and an automobile storage building at New York for the New York Central Railroad will take 1400 tons. The remainder of the week's total of about 5600 tons consisted of small contracts. Fresh inquiries were the lowest in many weeks, amounting to less than 1700 tons. Awards follow:

NEW YORK, 1400 tons, automobile storage building for New York Central Railroad at West End Avenue and Sixty-fifth Street, to Jones & Laughlin Steel Corporation.

PENNSYLVANIA RAILROAD, 300 tons, warehouse in Philadelphia at Thirty-first and Chestnut Streets, to Gilmour-Roslyn Steel Co.

CEMENTON, PA., 225 tons, building for Whitehall Cement Mfg. Co., to Jones & Laughlin Steel Corporation.

EVANSTON, ILL., 285 tons, Illinois Bell Telephone Co. building, to Concrete Steel Co.

CHICAGO, 110 tons, apartment building at 1242 Lake Shore Drive, to Joseph T. Ryerson & Sons.

CHICAGO, 400 tons, Goldblatt store, to Kalman Steel Co.

DES MOINES, IOWA, 300 tons, Hubbel Hotel, to Laclede Steel Co.

TACOMA, WASH., 2550 tons, Cushman project, unit No. 2, to unnamed bidder.

SACRAMENTO, 156 tons, paving in San Diego County, to unnamed bidder.

GLENDALE, 140 tons, apartment building, 132 South Orange Street, to unnamed bidder.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

NEW YORK, 200 tons, building at Mitchell Flying Field.

BUFFALO, 400 tons; cooperative elevator.

CLEVELAND, 200 tons, parcel post station.

WARREN, OHIO, 150 tons, highway bridge.

ST. LOUIS, 500 tons, boys' preparatory school for Kenrick Seminary; bids opened July 15.

SACRAMENTO, 208 tons, paving in Alameda County; bids July 17.

Railroad Equipment

Pennsylvania Expected to Buy 4000 More Car Bodies

THE railroad equipment market has been quiet the past week, and few sales and inquiries were made. The Buffalo & Susquehanna has ordered 200 50-ton steel hopper cars, while the Northern Pacific has purchased 100 flat cars. The Pennsylvania, which contracted for the construction of 4000 steel box car bodies a week ago, is expected to buy an additional 4000 soon. Details of the week's business follow:

Buffalo & Susquehanna has ordered 200 50-ton steel hopper cars from Pressed Steel Car Co.

Pennsylvania Railroad, which ordered 4000 steel box car bodies, as reported a week ago, is expected to order an additional 4000 soon.

Carnegie Steel Co. has ordered 22 gondola car bodies from Greenville Steel Car Co.

General Chemical Co. is inquiring for 46 tank cars.

Northern Pacific has ordered 100 flat cars from Pressed Steel Car Co., in addition to 200 recently reported.

Ford Motor Co. will buy six eight-wheel switching locomotives.

Timken Roller Bearing Co. has ordered an experimental locomotive from American Locomotive Co.

Obituary

WILLIAM M. JEFFERYS, director and superintendent of the Hanging Rock Iron Co., and also superintendent of the Union Iron Furnace, Ironton, Ohio, died at his home in Hanging Rock, Ohio, June 17. He had been connected with the Hanging Rock Iron Co. since 1901, when he joined the company as manager and superintendent of the Hamilton furnace. In April, 1928, he purchased the property of the company.

—

CHARLES H. DOELGER, one of the founders and senior member of Doelger & Kirsten, Milwaukee, manufacturers of alligator shears, died June 25 following an illness of six months. He was born in Milwaukee in 1865, and in partnership with Oscar F. Kirsten, established a machine shop in 1889, which for thirty years has been devoted exclusively to the production of all-steel shearing equipment. The company will continue with no changes in personnel.

—

IRVING J. BUDLONG, formerly head of the American Woodworking Machinery Co., died June 17 at his home in Saginaw, Mich., aged 60 years. Mr. Budlong at the time of his death was vice-president of the Merchon Mfg. Co., Saginaw.

—

MORRIS L. FOX, president, Pioneer Iron & Metal Co., and a resident of Racine, Wis., for thirty years, died June 27, aged 65 years.

—

EDWARD J. CARNES, president, E. J. Carnes Co., Medford, Mass., steel erector died suddenly at his home on June 30. Prior to the formation of the E. J. Carnes Co., he was for many years in charge of erecting for the New England Structural Co.

100,000 Tons of Steel Pipe Awarded

The A. O. Smith Corporation and National Tube Co. each have been awarded 50,000 tons of steel pipe for the Birmingham-Atlanta gas line.

Foundations for a battery of 70 new coke ovens have been completed at the Indiana Harbor, Ind., plant of the Inland Steel Co., Chicago.

PERSONAL

F. A. MERRICK, formerly vice-president and general manager, has been elected president of the Westinghouse Electric & Mfg. Co., East Pittsburgh, succeeding E. M. HERR, who has been made vice-chairman of the board of directors. He is a graduate of Lehigh University, Bethlehem, Pa., and soon afterward became associated with the Steel Motors Co., a subsidiary of the Lorain Steel Co., as manager and chief engineer. When the Steel Motors Co. was acquired by the Westinghouse company, he was made superintendent of the Canadian Westinghouse Co. Ltd., and assisted in its organization. He later became vice-president and general manager of the Canadian company. During the World War Mr. Merrick was assigned to organize the operations of the New England Westinghouse Co. After the war he was located in London for two years as special representative of the Westinghouse Electric International Co., and then returned to Canada to resume his duties as vice-president and general manager of the Canadian company. He has been a director of the company since 1925, at which time he was elected vice-president and general manager. Under Mr. Merrick's direction, the various Westinghouse plants were reorganized as separate units for greater efficiency.

F. A. MERRICK

E. M. HERR

—

ROBERT E. BELKNAP has resigned as New England manager of the Bethlehem Steel Co. He was appointed to that position in 1922, following the acquisition of the Lackawanna Steel Co. and the Midvale Steel Co. by the Bethlehem Steel Co. He started in the steel business with the Pennsylvania Steel Co., first at New York and subsequently at Chicago. Mr. Belknap has been in poor health for some time and he plans to take a long rest before engaging in business again. He is succeeded as manager by ROBERT B. WALLACE. Mr. Wallace was manager of the company's New England business prior to Mr. Belknap, and is one of the most widely known steel men in New England. He has been connected with the Bethlehem Steel Co. for 19 years, for seven years as salesman and from 1917 until 1922 as sales agent. In recent years he served as sales manager of structural steel and plates. THOMAS DRANSFIELD, sales engineer for the past two years in the Boston office, succeeds Mr. Wallace as manager of structural steel and plate sales.

—

E. F. MYERS has been elected president of the Ironton Fire Brick Co., Ironton, Ohio. Other officers are W. P. Lewis and C. E. Bales, vice-presidents, and W. D. Lewis, secretary.

—

C. A. DUNN, Detroit, has been elected to the board of directors of the Appleton Steel Tube Co. Appleton, Wis. He succeeds HUGH G. CORBETT, of Kenosha, Wis., who recently resigned.

—

H. M. FOSTER, for the past 10 years with Wheelock-Lovejoy & Co., Cambridge, Mass., and for a number of years New York district sales manager, has been appointed general manager of sales of the Rhinegold Steel Products Co., 225 Broadway New York, agent in the United States for the Gewerkschaft Rheingold, Düsseldorf, Germany, distributer of special steels made by Stahlwerk Becker A. G., Willich, near Krefeld.

—

SAMUEL C. REBMAN has resigned his position as New York representative of the Sweets' Steel Co., Williamsport, Pa., to become as of July 1 manager of sales of tubing and allied products for the Danville Structural Steel Co., of Danville, Pa. Mr. Rebman was for many years with the Danville Structural Tubing Co., but severed that connection in 1926. In 1928 the business was reorganized as the Danville Structural Steel Co., and an extensive program of building and expansion was begun.

—

R. S. DUTTON, who for 35 years has been with the firm of Pickands, Brown & Co., Chicago, retired July 1. He will continue to make his home in Chicago but plans to occupy much of his time in traveling. Mr. Dutton went to Chicago in 1890 and accepted a position with the Illinois Steel Co. at the old Union works, which has been dismantled. At that time Robert Forsythe was general manager. In 1891 he was transferred to the cost department at South Works. One year later he entered the office of H. A. Gray, comptroller for the Illinois Steel Co. He accepted the position of bookkeeper for Pickands, Brown & Co. in 1895. Later he became cashier for the company, and in 1911 he was made manager of sales, the position he occupied at the time of his retirement. In the intervening 35 years he watched the office force grow from six to more than 75. Mr. Dutton is succeeded by SNELLING S. ROBINSON, who has been assistant manager of sales since October, 1928. Mr. Robinson went to Chicago from the Erie, Pa., office of Pickands, Mather & Co.

R. S. DUTTON

—

JOHN V. W. REYNDERS, New York, sailed June 27 on the Olympic for a brief business trip to England and the Continent, and expects to return shortly after Aug. 1.

—

W. EARLE PASHLEY has been elected second vice-president and a director of the C. F. Pease Co., Chicago, manufacturer of blue-printing machinery.

—

W. C. SUTHERLAND, who has been general superintendent, Pittsburgh

Steel Co., Pittsburgh, has been appointed assistant to the president of the company, succeeding the late A. R. MAXWELL. He went with the company 12 years ago, having previously been identified with the Illinois Steel Co. at its Gary, Ind., works. After serving for a time as superintendent, Allenport, Pa., works, of the Pittsburgh company, he went with the Pittsburgh Steel Products Co. in a similar capacity, and when the manufacturing departments of the two companies were combined, he was made general superintendent. He has been succeeded in this position by D. P. KING, recently assistant superintendent. Mr. King has been with the company for 28 years, having served continuously in the operating departments.

—

O. H. ESCHHOLZ has been appointed manager of the patent department, Westinghouse Electric & Mfg. Co., East Pittsburgh, succeeding O. S. SCHAIRER, who has resigned to go with the Radio Corporation of America New York, in a similar capacity. Mr. Eschholz was graduated from the Worcester Polytechnic Institute, Worcester, Mass., in 1910, and immediately became associated with the Westinghouse company. He has been prominently identified with the electric arc-welding activities of the company, and during the war participated in the work of the welding committee of the Emergency Fleet Corporation. In 1924 he became production engineer for the Standard Gauge Steel Co., Beaver Falls, Pa., but returned to Westinghouse the following year to enter the patent department.

—

WILLIAM G. MARSHALL, since 1926 director of personnel for the Philadelphia Co. and affiliated corporations, has been appointed assistant to T. P. Gaylord, vice-president of the Westinghouse Electric & Mfg. Co., East Pittsburgh, and will be in charge of employee relations. He is a graduate of Washington and Jefferson College, Washington, Pa., and of the University of Pittsburgh law school. He has been identified with the Philadelphia Co. for the past 10 years.

—

H. W. NEWTON, who has been connected with the Stephens-Adamson Mfg. Co., Aurora, Ill., for several years as a designing engineer, has been appointed district manager of the Birmingham office of the company, succeeding W. E. HARRIS.

—

W. H. KAY has been appointed district sales manager at Kansas City for the Surface Combustion Co., Toledo. He has been associated with the company for several years, first in the erection department and then in the estimating and sales departments.

—

E. F. TALMAGE, formerly with the Halcomb Steel Co., at Cleveland, has become Chicago district sales manager of the Timken Steel & Tube Co., with headquarters at 360 North Michigan Avenue.

MAGNUS W. ALEXANDER, president, National Industrial Conference Board, New York, sailed June 29 on the Statendam for the Netherlands, to keep an engagement to address the fifth general congress of the International Chamber of Commerce at Amsterdam, on July 9, on "International Industrial Statistics as an Aid to World Progress." He is chairman of the American National Committee of the International Chamber for the development of international industrial statistics.

—

HARRY HOLIDAY, general manager of sales of the American Rolling Mill Co's. forged steel wheel division, has been appointed general superintendent of Butler works, Butler, Pa., the company's Columbia division. Mr. Holiday joined Armco in 1923 as assistant to the vice-president, in charge of construction of steel works. Later he was appointed assistant to the president, and after the Columbia Steel Co. was purchased, he was elected a vice-president of that division. He has been general manager of sales since December, 1927, with headquarters in Pittsburgh.

—

JOHN A. TOPPING, chairman, Republic Iron & Steel Co., was injured in a taxicab collision in Washington on Tuesday of last week. He was taken to a hospital, where three stitches were taken in a cut in his forehead. He is now back at his office at 17 Battery Place, New York. Mr. Topping was in Washington to testify on behalf of the American Iron and Steel Institute at a hearing on the metal tariff schedules.

—

GEORGE H. WALKER, president, W. A. Harriman & Co., and WILLIAM F. CUTLER, vice-president, American Brake Shoe & Foundry Co., have been elected directors of the National Bearing Metals Corporation.

—

ROBERT R. BRIDGMAN has been appointed manager of the Buffalo office of the O'Brien Steam Specialty Co., Syracuse. He is a graduate of Cornell University, and recently has been with the Stewart Motor Corporation of Buffalo as engineer in charge of Bendix four-wheel brakes. The company's Buffalo office is at 333 Jackson Building.

—

WILLIAM ROBBINS has been appointed district manager in charge of the Chicago office of the Chisholm-Moore Hoist Corporation, Tonawanda, N. Y.

—

J. MARVIN DOYLE, who has been engaged in the sheet and tin plate trade for the past 20 years, has severed his connection with Dickerson, Van Dusen & Co., New York.

—

C. E. POSTLEWAITE has been appointed assistant vice-president and F. O. SCHRAMM general sales manager of the Pressed Steel Car Co., effective July 1.

A. A. Stevenson Retires from Standard Steel Works Co.

ON July 1, A. A. Stevenson retired from the vice-presidency of the Standard Steel Works Co., Burnham, Pa., after 41 years of continuous service with that company. He successively occupied the position of traveling engineer, which he assumed Aug. 1, 1888; manager of wheel department in 1893; engineer in 1898; assistant superintendent in 1901; superintendent in 1903; vice-president in 1908; vice-president and engineer in 1917 and vice-president in charge of manufacture since 1920.

He entered the employ of Southwark Foundry & Machine Co., Philadelphia, as draftsman in July, 1881, remaining there until March, 1886, when he was foreman of the drafting room. He then went to Cambria Steel Co., Johnstown, Pa., as draftsman in the chief engineer's office. In July, 1887, he was made foreman of the forge and axle plant, and a year later he joined the Standard company.

A. A. STEVENSON

Mr. Stevenson has been active in various technical and engineering societies. He was the first chairman of the iron and steel committee of the American Institute of Mining Engineers, appointed in June, 1908, and was elected vice-president of the Association of American Steel Manufacturers in March, 1909, becoming president in March, 1911, holding that position for three years. He became a member of the executive committee of the American Society for Testing Materials in October, 1911, and was elected vice-president in 1914, serving two years, and in 1916 he was elected president. At the annual convention of the A. S. T. M. at French Lick, Ind., in June, 1927, Mr. Stevenson was made an honorary member of the society. Mr. Stevenson will continue to carry on many of the technical activities in which he has been engaged for several years, including that of the American Standards Association, of which he is past chairman.

Exports Running Far Above 1928

Total in Five Months Up 23 Per Cent; Rolled and Finished Steel, 25 Per Cent Higher—Imports 10 Per Cent Less in 1929

WASHINGTON, July 27.—The decline of 16,064 gross tons in iron and steel exports of the United States in May to 261,516 tons, from 277,580 in April, as noted in THE IRON AGE of June 27, was reflected in several lines, while the increase of imports to 74,272 tons from 54,337 tons, an upturn of 19,935 tons also made in a number of products, was apparently due to possible increases in tariff duties. The average daily movement of exports during the 30 days of June was 8711 tons, against an average of 8954 tons during the 31 days of May. The average daily receipts were 2476 tons in May, against 1811 tons in April.

For the five months of the current year exports showed a sharp increase over the corresponding period of last year, the respective totals being 1,344,028 tons and 1,096,595 tons. A contrary situation characterized the import movement. Incoming shipments for the first five months of the current year aggregated only 294,210 tons, against 327,486 tons for the corresponding period of 1928.

Where the Chief Sales Were Made

More than one-fifth of the export movement in June was in scrap, 55,916 tons going abroad, distributed among principal consuming countries as follows: Japan, 12,295 tons; Canada, 11,273 tons; Poland, 11,069 tons; and Italy 10,399 tons. Exports of plain structural material rose to 30,331 tons in May (20,790 tons in April), and Canada took 28,570 tons. Of the 20,185 tons of plates exported in May (18,006 tons in April) Canada took 18,291 tons. Canada also took the bulk of the 15,244 tons of skelp exported in May. This movement reflected an increase of 3867 tons over that of April.

Tin plate exports declined to 14,537 tons in May (25,991 tons in April). In May Canada took 4051 tons; Japan, 2310 tons; Mexico, 1228 tons; and Argentina, 1171 tons. Of the 13,740 tons of black steel sheets exported in May (14,615 tons in April), 9532 tons went to Canada and 1643 tons to Japan. Exports of galvanized sheets in May dropped to 11,342 tons from 14,404 tons. Of the May shipments, 2810 tons went to Canada; 1508 tons to the Philippine Islands and 1146 tons to Mexico.

Steel bar exports in May were 14,720 tons (22,032 tons in April), ship-

Exports of Iron and Steel from the United States

(In Gross Tons)

	May		Five Months Ended May	
	1929	1928	1929	1928
Pig iron	8,088	3,701	27,689	19,655
Ferromanganese	88	1,060	909	4,523
Scrap	55,916	59,633	206,904	186,213
Pig iron, ferroalloys and scrap	*64,092*	*64,394*	*235,502*	*210,391*
Ingots, blooms, billets, sheet bar	6,704	1,386	20,852	9,544
Skelp	15,244	17,335	40,121	42,086
Wire rods	3,197	3,551	20,286	13,711
Semi-finished steel	*25,145*	*22,272*	*81,259*	*65,341*
Steel bars	14,720	13,726	100,371	56,952
Alloy steel bars	974	1,877	10,469	6,216
Iron bars	341	255	2,583	1,660
Plates, iron and steel	20,185	13,163	89,656	57,197
Sheets, galvanized	11,342	14,175	73,816	64,635
Sheets, black steel	13,740	15,272	77,045	71,088
Sheets, black iron	1,526	1,203	6,172	5,876
Hoops, bands, strip steel	6,233	6,282	36,583	22,877
Tin plate; terne plate	14,537	22,462	118,080	102,823
Structural shapes, plain material	30,331	18,498	114,598	70,517
Structural material, fabricated	6,652	7,181	47,308	30,820
Steel rails	10,499	18,251	78,177	96,641
Rail fastenings, switches, frogs, etc.	2,318	2,637	13,824	25,576
Boiler tubes	1,613	1,260	8,274	6,957
Casing and oil-line pipe	7,314	10,193	64,465	44,299
Black and galvanized welded pipe	8,327	8,994	56,212	43,477
Malleable iron screwed pipe fittings	701	694	5,148	3,494
Plain wire	3,518	3,808	22,348	19,015
Barbed wire and woven wire fencing	5,409	7,156	29,293	31,426
Wire cloth and screening	142	119	762	680
Wire rope	505	402	3,184	2,148
Wire nails	513	1,830	7,006	7,307
Other nails and tacks	537	772	4,421	4,167
Horseshoes	8	37	138	179
Bolts, nuts, rivets and washers, except track	1,234	1,227	6,921	5,219
Rolled and finished steel	*163,219*	*171,474*	*976,854*	*781,246*
Cast iron pipe and fittings	2,729	3,447	13,678	14,261
Car wheels and axles	1,584	1,501	11,019	5,922
Iron castings	1,174	1,030	6,264	5,630
Steel castings	1,011	1,180	5,060	4,428
Forgings	996	1,379	6,550	3,677
Castings and forgings	*7,494*	*8,537*	*42,571*	*33,918*
All other	1,566	1,213	7,842	5,699
Total	261,516	267,890	1,344,028	1,096,595

Imports of Iron and Steel into the United States

(In Gross Tons)

	May		Five Months Ended May	
	1929	1928	1929	1928
Pig iron	14,393	9,732	62,065	63,496
Ferromanganese*	4,756	5,094	27,050	18,535
Ferrosilicon†	733	133	3,576	1,345
Ferrochrome‡	121	38	220	262
Scrap	6,837	3,961	36,615	15,129
Pig iron, ferroalloys and scrap	*26,840*	*18,958*	*129,526*	*98,767*
Steel ingots, blooms, billets and slabs	2,863	3,712	10,712	9,816
Wire rods	2,778	1,824	7,260	8,298
Semi-finished steel	*5,641*	*5,536*	*17,972*	*18,114*
Rails and splice bars	744	863	1,728	6,364
Structural shapes	14,744	16,010	56,833	74,404
Boiler and other plates	75	482	2,350	942
Sheets and saw plates	3,199	3,247	8,164	12,729
Steel bars	3,912	9,681	15,102	44,576
Bar iron	222	118	1,311	933
Hoops, bands and cotton ties	5,039	1,722	11,433	12,536
Tubular products (wrot.)	4,170	4,125	18,024	18,282
Nails, tacks, staples	1,099	821	3,461	3,155
Tin plate	23	384	115	550
Bolts, nuts, rivets and washers	11	39	104	126
Round iron and steel wire	467	239	2,971	1,688
Barbed wire	360	308	2,353	1,566
Flat wire; strip steel	346	332	941	1,073
Steel telegraph and telephone wire	.....	82	.....	118
Wire rope and strand	206	121	1,008	619
Other wire	77	46	264	277
Rolled and finished steel	*14,694*	*38,620*	*126,162*	*179,938*
Cast iron pipe	6,907	9,150	19,595	28,992
Castings and forgings	190	214	955	1,675
Total	74,272	72,478	294,210	327,486
Manganese ore*	27,767	16,449	112,849	71,267
Iron ore	275,762	211,270	1,223,783	1,079,520
Magnesite (dead burned)	.....	1,871	8,599	15,184

*Manganese content only.
†Silicon content only.
‡Chromium content only.

Destination of Iron and Steel Exports from the United States

(In Gross Tons)

Country of Destination	May, 1929	January Through May 1929	January Through May 1928
North and Central America and West Indies	*150,930*	*675,302*	*526,167*
Canada and Newfoundland	134,559	558,558	434,287
Cuba	5,031	31,728	25,902
Guatemala	472	3,492	5,297
Honduras	636	5,991	3,522
Mexico	6,870	35,209	31,824
Panama	1,170	9,181	7,061
Salvador	184	3,979	1,217
British West Indies	471	10,723	3,357
Other West Indies	998	12,257	10,451
Other Central America	539	4,184	3,249
South America	*21,421*	*188,295*	*184,068*
Argentina	5,700	45,367	39,372
Brazil	4,322	28,835	39,677
Chile	2,930	28,962	34,147
Colombia	2,354	22,007	29,517
Peru	829	15,307	11,057
Uruguay	288	5,067	3,657
Venezuela	4,263	40,124	23,803
Other South America	735	2,626	2,838
Europe	*42,079*	*161,053*	*107,845*
Belgium	80	1,635	6,404
France	783	8,290	1,962
Germany	4,412	11,958	11,258
Italy	12,945	53,937	30,639
Netherlands	193	1,346	1,151
Poland and Danzig	11,075	40,356	23,046
Rumania	232	1,623	1,271
Soviet Russia	88	1,953	1,402
United Kingdom	5,595	25,856	21,503
Other Europe	6,676	14,099	9,209
Far East	*45,296*	*310,536*	*272,256*
British Malaya	517	4,323	3,281
China	3,321	36,764	50,666
Netherlands East Indies	1,798	33,552	11,135
India and Ceylon	1,809	9,806	12,194
Japan	29,661	159,184	141,185
Kwantung	118	7,262	2,905
Philippine Islands	5,031	41,973	40,777
Australia	1,734	8,854	5,991
New Zealand	704	2,569	952
Other Asia and Far East	603	6,249	3,170
Africa	*1,790*	*8,842*	*6,259*
Union of South Africa	817	3,164	2,792
Egypt	533	4,095	2,461
Mozambique	436	816	320
Other Africa	4	767	686
Total	261,516	1,344,028	1,096,595

ments going largely to Canada, which took 9802 tons; Japan, 1677 tons; United Kingdom, 1077 tons. Of the 10,499 tons of rails exported in May, 3690 tons went to Canada and 2047 tons to Japan.

Whence the Chief Incoming Supplies

Structural shapes constituted the largest item of importation in May, amounting to 14,744 tons (12,300 tons in April), of which 5865 tons came from Belgium, 5117 tons from Germany and 3542 tons from France. Pig iron imports rose to 14,393 tons in May (6693 tons in April), coming largely from the United Kingdom, British India and the Netherlands. Of the 6907 tons of cast iron pipe imported in May, 6003 tons came from France and 716 tons from Belgium.

Belgium supplied 2397 tons; Germany, 1239 tons, and France, 944 tons of the 5039 tons of hoops, bands and cotton ties, imported in May. Imports of wrought pipe, largely seamless tubes totaled 4170 tons, of which Germany furnished 2691 tons; Canada 404 tons; United Kingdom, 351 tons; Sweden 318 tons; and France, 315 tons.

UNITED STATES IMPORTS OF IRON AND STEEL PRODUCTS

(In Gross Tons)

	May	April
Austria	60	24
Belgium	13,577	10,015
Czechoslovakia	55	30
France	12,281	5,744
Germany	15,579	11,031
Italy	256	310
Netherlands	3,066	1,261
Norway	291	3,217
Sweden	3,927	3,483
Switzerland	59	19
United Kingdom	9,517	5,981
Europe	*58,668*	*41,115*
Canada	10,982	11,226
Mexico	32	31
Cuba	0	61
Virgin Islands	0	75
British India	4,314	1,826
British Malaya	275	0
Japan	1	3
Total	74,272	54,337

Of the 4756 tons of ferromanganese imported 3090 tons came from Canada and 1425 tons from the United Kingdom. Soviet Russia furnished 20,375 tons of the 27,767 tons of manganese ore imported while 6851 tons came from Brazil and 255 tons from India.

American Exports This Year Are Largest Since 1920

American exports in the fiscal year 1928-1929 will be the largest since 1920, amounting to close to $5,400,000 estimates the National Foreign Trade Council. This means that at the dollar value of 1913 the United States is shipping more than 40 per cent more goods abroad than before the war. The export balance will be nearly a billion dollars, or about one-third larger than for the average of the past five years. Many of the reasons for this rapid growth of American foreign trade are explained in "American Foreign Trade in 1929," the annual handbook of the National Foreign Trade Council which has just been published. The handbook contains a record of the sixteenth national foreign trade convention at Baltimore this spring.

Japanese Steel Output Increasing

WASHINGTON, June 28.—Pig iron production in Japan during January and February totaled 259,904 metric tons, compared with 236,174 tons in the corresponding period of last year, while steel ingot output increased to 350,177 tons from 282,591 tons, according to a report received by the Department of Commerce from Tokio.

Production of rolled steel products increased to 290,994 tons from 252,413 tons, as follows: Sheets less than 0.7 mm. thick, 25,890 tons, compared with 15,072 tons in the first two months of 1928; bars, 103,677 tons, compared with 79,100 tons; shapes, 40,232 tons, compared with 36,736 tons; rails, 46,365 tons, compared with 41,603 tons; wire rods, 10,130 tons, compared with 9880 tons; pipe, 10,002 tons, compared with 9441 tons; and miscellaneous products, 6079 tons, compared with 5968 tons. Plate output, alone, registered a decline from 54,613 tons in the first two months of 1928 to 48,619 tons in January and February of this year.

New Record in Industrial Electric Consumption

Activity in manufacturing plants as measured by their consumption of electric energy is reported by *Electrical World* to have made a new high record in May. The index was 136.9, on the basis of 100 as the average for 1923-1925. The increase over April, which showed 136.4, was only fractional. Compared with May of last year, however, in which the index was 119, there was a substantial gain.

At the head of the list stands the automobile industry, including parts. This showed 161.8 in May, compared with 170.6 in April and with 141.6 a year ago. Rubber and its products, mainly tires, was in second position, with 157.6 in May, a slight increase over April. The metal industries group, in third position, was 154.8 in May, compared with 149.9 in April, and with 123.6 a year ago.

Metal industries were broken into two parts. Rolling mills and steel plants showed a new high record at 172.2, compared with 153.3 in April and only 125 a year ago. Other metal-working plants, both ferrous and non-ferrous, were 144.2, a slight recession from the 148.3 of April, but well above the 122.7 of May, 1928.

Improvement in European Steel Continues

England and Continent Share in Better Demand—Mergers and Associations Hold Interest—Export Restriction Irks Germany

(By Cable)

LONDON, ENGLAND, July 1.

THE shortage of Cleveland pig iron continues, but more local mines and additional coke ovens are resuming operations. By autumn it is expected that fully 50 Northeast Coast furnaces will be operating. Meanwhile makers are declining to sell for the last quarter.

Hematite iron prices are firm and output is to be increased this month by blowing in the Linthorpe-Dinsdale furnace. Costs of production are increasing and, with good export sales, prices are expected to go higher.

Continental material is quiet here, as consumers are generally disinterested. Continental mills are seeking orders for semi-finished material and merchant bars, but are still firm on plates and shapes.

Tin plate is quiet but some good inquiries are in the market for domestic and export shipment. Most mills are well situated, but prompt tin plate is inclined toward easiness, as certain mills have vacant spaces in their schedules.

Galvanized sheets are dull, but prices are being maintained. Japanese demand for black sheets is quiet.

Steel Industries of Great Britain, Ltd., with a capital stock of £11,000,000 ($53,350,000) is now registered to acquire the United Steel Co.'s and the United Strip & Bar Mills, Ltd., to enter into an agreement with the Austin Friars Trust and to carry on the business of steel and iron manufacture. Negotiations for acquiring other interests are reported well advanced, but no details are available.

Belgian production in May was 348,000 tons of pig iron, 330,000 tons of raw steel and 299,000 tons of rolled products. On May 31, there were 56 furnaces in blast.

The German raw steel output in May established a new post-war record, with 1,421,000 tons. The Luxemburg output in May was 248,000 tons of pig iron, and 230,000 tons of raw steel. The Saar output in May was 186,000 tons of pig iron, 187,000 tons of raw steel and 138,000 tons of rolled steel.

British Pig Iron Makers Well Sold Ahead

LONDON, ENGLAND, June 21.—Interest continues to be centered in the pig iron market, where a strong condition prevails. The virtual withdrawal of Continental competition has placed British furnaces in a much stronger position in the domestic market. Moreover, foreign demand for British pig iron has increased. The high and uncertain cost of production, however, prevents producers from materially increasing their output. Furnaces in blast at the end of May totaled 159, the largest number for any month since October, 1927, and by the end of June there will have been a further increase.

Scarcity of pig iron is most acute in the Cleveland district, where furnaces are already sold out until October and are not inclined to consider contracts for the last quarter. Consumers in that area who need immediate supplies of iron are buying from other districts, as the tonnages in the hands of merchants are unimportant and high in price. A similar situation prevails in the hematite iron market, except that July deliveries of East Coast mixed numbers are still obtainable in small tonnages.

More of the semi-finished material being consumed now is from British producers, who are operating at a good rate. In certain inland districts British semi-finished steel sells at less than Continental, but on the coast and in Wales, Continental material is still rather widely used. Recently demand for foreign semi-finished steel has declined, particularly among sheet bar users, but this has been caused by slackening business in sheets, which has forced certain mills to curtail operations.

Finished steel business in general is good. Shape and small bar mills are heavily booked, but the capacity

British and Continental European Export prices per gross ton, f.o.b. United Kingdom Ports, Hamburg and Antwerp, with the £ at $4.85

British Prices, f.o.b. United Kingdom Ports

Cleveland No. 3 foundry	£3	12½s.			$17.58		
East Coast Hematite	3	14½	to £3	15s.	18.06	to	$18.18
Ferromanganese, export	14	0			67.90		
Billets, open hearth	6	10	to 6	12	31.52	to	32.12
Sheet bars, open hearth	6	10			31.52		
Black sheets, Japanese specifications	13	5			64.26		
Tin plate, per base box	0	18¼	to 0	18½	4.42	to	4.48
Rails, 60-lb. and heavier	7	15	to 8	15	37.59	to	42.43
					Cents per Lb.		
Steel bars, open hearth	7	15	to 8	10	1.67	to	1.84
Beams, open hearth	7	2½	to 7	12½	1.55	to	1.65
Channels, open hearth	7	7½	to 7	17½	1.60	to	1.71
Angles, open hearth	8	2½	to 8	12½	1.76	to	1.86
Ship plates, open hearth	7	12½	to 8	2½	1.66	to	1.76
Black sheets, No. 24 gage	10	5	to 10	10	2.21	to	2.27
Galvanized sheets, No. 24 gage	13	10	to 13	12½	2.92	to	2.94

Continental Prices F.O.B. Antwerp or Hamburg

Foundry iron, 2.50 to 3.00 per cent sil., 0.50 to 0.90 per cent phos.	£3	10s.	to £3	14½s.	$16.97	to	$18.06
Foundry iron, 2.50 to 3.00 per cent sil., 1.00 per cent and more phos.	3	12			17.45		

Billets, Thomas	5	3	to 5	7½	24.98	to	26.07
Sheet bars, Thomas	5	7	to 5	7½	25.94	to	26.07
Wire rods Low C., No. 5 B.W.G.	6	5	to 6	6¼	30.31	to	30.61
Black sheets, No. 31 gage, Japanese	12	10			60.62		
Rails, 60 lb. and heavier	6	10*			31.52		
Rails, light	6	1½			29.46		
					Cents per Lb.		
Steel bars, merchant	5	16	to 6	0	1.25	to	1.29
Steel bars, deformed	5	15½	to 5	18	1.25	to	1.28
Beams, Thomas, British standard	5	5	to 5	9½	1.13	to	1.14
Channels, Thomas, American sections	6	1			1.31		
Angles, Thomas, 4-in. and larger, over ⅜-in. thick	5	9			1.14		
Angles, Thomas, 3-in.	6	0			1.30		
Ship plates, open-hearth, inspected	7	10			1.62		
Hoop and strip steel, over 6-in. base	6	2½			1.32		
Wire, plain, No. 8 gage	7	10			1.62		
Wire, galvanized, No. 8 gage	9	10	to 9	12½	2.06	to	2.12
Wire, barbed, 4-pt. No. 12 B.W.G.	12	0½			2.60		
Wire nails, base	8	0½			$1.74 per keg		
Wire nails, assortments, 1 to 6-in. keg	10	9			2.26		

*Open-hearth steel, 10s. ($2.42) per ton extra.

of plate mills is still too large and there is keen competition for plate tonnage, with makers seeking uninterrupted operation.

Germany Seeks Cancellation of Export Restriction

HAMBURG, GERMANY, June 17.—At the next meeting of the International Steel Cartel, at Vienna, it is understood that German steel producers will ask that all export restrictions on the German steel quota be abandoned. Germany has an export allotment of 330,000 metric tons a month, which was fixed when the German mills complained of the high total of fines paid for overproduction, when most of the excess was to supply a heavy domestic demand in Germany. At that time the German penalty for excess output was reduced from $4 to $2 a ton, with the understanding that the excess was for domestic consumption and that exports would be limited. None of the other members operates under an export restriction.

German mills estimate that, because of reduced consumption of steel in Germany, it will be necessary to export 475,000 to 500,000 tons a month in the next few years—42 to 45 per cent of the total output of the country instead of, as at present, about 33 per cent. It is expected that the German delegates will make continued adherence to the cartel conditional on a cancellation of the export restriction.

To Cut German Scrap Exports

HAMBURG, GERMANY, June 17.—The Verein Eisen und Stahl Industrieller, representing steel scrap consumers, has been informed by the Government that the export embargo on heavy melting steel and machinery cast scrap will be tightened in the future. Special export licenses will only be granted when there is an abundant supply of scrap in the German market. Meanwhile scrap has been advancing from its usual level, which is 20 per cent lower than the market abroad.

British Furnaces Renew Price Control

LONDON, ENGLAND, June 21.—The blast furnaces of the Midlands are so well satisfied with their experiment in cooperative marketing and price control that they have renewed their agreement for another 12 months. Only one producer remained outside the pool. Some Midland furnaces believe that they could sell more pig iron than they are now producing, but are not prepared to risk blowing in more stacks, partly because of the uncertain coke supply. Increased supplies of coke will be required for furnaces being blown in other districts, and Midland smelters do not desire to accentuate the competition for fuel during the present shortage.

New German Association Formed

Manufacturing Consumers of Steel Combine to Protect Interests—May Not Renew Producers' Syndicates

BERLIN, GERMANY, June 15.—Manufacturers of finished products other than machinery, made from iron, steel and non-ferrous metals, have formed the Centralverband der Eisen, Metal und Blechverarbeitenden Industrie to protect their interests. Members of the new association employ more than 500,000 and include all hardware makers and most of the producers of finished metal products. The administration of the association is in the hands of Commercial Councilor Neitzert of Fulda, Herr Hager of Remscheid and Commercial Councilor Schwarz of the Bing Werke in Nuremberg.

Prospects for the renewal of domestic steel syndicates have not improved. The director of the Mannesmann Tube Co. has stated that, if the Friedrich Krupp A. G. persists in its plan to erect a tube mill with an annual capacity of 150,000 tons, the entire German syndicate system will fail. There are two groups among the steel companies—one, of which the Vereinigte Stahlwerke A. G. is representative, advocates renewal of all syndicates or none; the other, represented by the Friedrich Krupp A. G., sees no advantage in the renewal of any of the syndicates. Both groups agree that unless the syndicates are renewed Germany cannot remain in the International Steel Cartel.

Continuance of the International Steel Cartel, which expires next fall, depends on the action taken on the German domestic syndicates. Probably the International cartel will be renewed temporarily for six months or a year. If so, it is certain that Germany will demand an increase in its quota. According to German estimates, the French quota is 90.3 per cent of the largest French monthly production, the Luxemburg quota is 87.3 per cent, and the Belgian quota 82.9 per cent, while Germany's quota is only 71.2 per cent of its highest monthly output. It is also claimed that Germany's capacity has increased more than that of other members since formation of the cartel.

German Plant to Make Steel From Sponge Iron

HAMBURG, GERMANY, June 17.—A steel plant being erected at Bochum by the Vereinigte Stahlwerk A. G., Düsseldorf, and the Friedrich Krupp A. G., Essen, for the production of special steel under the Norsk Staal patents is to have a capacity of 42,000 to 45,000 metric tons a year instead of about 20,000 tons as originally announced. Sponge iron is to be used as a raw material. The plant will be completed earlier than had been planned and will probably be in operation some time in October.

Since its formation, the German Dye Stuff Corporation has secured a part interest in the company formed to build the plant, and is represented on the board of directors. The German Dye Stuff Corporation is a producer of non-ferrous metals, controlling the entire output of "electron" (magnesium) metal, but has heretofore had no financial interest in the steel industry. The holding company for the Norsk Staal patents, which will dispose of licenses in other countries, has increased its capital stock to 4,000,000 m. ($956,000), all of which is held by the Vereinigte Stahlwerk A. G., Friedrich Krupp A. G., and the German Dye Stuff Corporation.

The annual report of Schubert & Salzer, Chemnitz, largest builders of stocking knitting machinery in Germany, shows that their exports to the United States have trebled. Unfilled orders from the United States total about $3,500,000.

Increase in German Export Bounties Urged

BERLIN, GERMANY, June 15.—As part of the negotiations for the renewal of the domestic syndicates, which expire this year or in 1930, a modification of the agreement under which the Ingot Steel Syndicate grants price rebates to steel consumers manufacturing products for export is being considered.

The manufacturers' association, "Avi," is expected to demand an increase in rebates equal to the full difference between German and lower world market prices. Under the present plan, rebates do not quite represent the full difference in prices. The manufacturers also demand that the rebates shall be paid in cash, instead of being booked to their credit and applied on subsequent orders.

Three Leading Italian Plants May Merge

MILAN, ITALY, June 15.—The three leading Italian steel works—Societa Anonima Ilva, with plants at San Giovanni, Torre Annunziata, Balzaneto, Bagnoli and Sestri Ponente; the Societa Anonima Terni at Terni, and the Societa Ferriere de Voltri, with plants at Voltri and Oneglia—have entered into negotiations for a merger, under the suggested name of United Italian Steel Works. Should this combination be made, the new corporation would control about two-thirds of the total steel production of Italy.

German Foreign Trade Improving

Mills Dependent on Exports to Maintain Operating Rates —Small Producers Suffer from Lack of Capital

BERLIN, GERMANY, June 15.—Business has begun to show improvement, with an increasing demand from both domestic and export consumers and a continued decline in unemployment. A rapid revival of industry, however, is prevented by a shortage of capital, as it is almost impossible to market bonds either in Germany or abroad. In the iron and steel industry the small companies are seriously affected. In some instances manufacturers of small hardware have been compelled to refuse large orders because of inadequate finances. A renewed influx of foreign capital is not expected until the new Young plan is in force.

The credit stringency is checking building activity and demand for structual steel is smaller than a year ago. Steel bars and sheets are inactive, and orders from shipyards have declined. With the steel industry increasingly dependent upon foreign trade to maintain operating rates, there has been steady improvement in exports, especially of semi-finished material to other European countries and of pig iron to consumers not receiving sufficient tonnage from British furnaces, which are heavily booked with orders. Foreign trade in wire rods and wire products has been good, April shipments totaling 85,772 tons compared with 52,180 tons in March, and exports of wire products to the United States show a rising tendency. Exports of iron and steel in four months through April were 1,726,622 metric tons, against imports of 567,734 tons.

Exports of cutlery, principally from Solingen, are rapidly increasing, but average prices are lower because the larger portion of sales are to Asiatic markets. Exports of cutlery in April totaled 738 metric tons, compared with 586 tons in March. Sales to India and the Dutch East Indies have increased, and business with Argentina has doubled.

German Motor Car Builders May Erect American Plants

HAMBURG, GERMANY, June 17.—Manufacturers of high-priced automobiles here are giving increased attention to the United States as a market for their products, and it is believed that one and possibly two German motor car builders may establish assembly plants in America.

The Mercedes-Benz company, which has been long interested in the United States market, is mentioned among the possible builders of American assembly plants. This company is now selling Diesel engine trucks and 120 180-hp. compressor-type passenger automobiles in the United States.

Japanese Black Sheet Prices Decline

NEW YORK, July 1.—Exporters in close contact with the market in Japan report dealers there overstocked with light-gage black sheets, continued high operating rates of the Japanese sheet mills and declining business with China in galvanized sheets. These conditions have depressed prices of black sheets in the Japanese market, and recent quotations of the Kawasaki Dockyard Co., Kobe, have been 187 yen ($82.28) per ton, delivered to Tokio warehouses. Deducting from this delivered price the duty of 33.06 yen ($14.55) per ton and the freight rate from Yokohama to Tokio of 2 yen (88c.) per ton, imported light-gage sheets would have to be sold at 151.94 yen ($66.85) per ton, c.i.f.

The Government steel works is quoting even lower prices, asking 180.83 yen ($79.57) per ton, or, deducting the duty and freight rate from Yokohama to Tokio warehouses, the equivalent of 145.77 yen ($64.14) per ton c.i.f. Exporters are not seeking new sheet business in Japan, with the domestic price too low for British or American competition.

Increase in Imports of Pig Iron in May

WASHINGTON, June 27.—Imports of pig iron in May advanced to 14,393 gross tons, or almost as much as the April and March tonnages combined—6693 tons and 8572 tons. The May total, however, was lower than the 16,299 tons in February. It was about 50 per cent above the 9732 tons of May, 1928.

For the five months, imports at 62,065 tons have been slightly less than the 63,496 tons of last year. There has not been much change in the line-up of countries of origin, although tonnage from Great Britain has fallen off nearly 20 per cent in favor of additions to the amounts received from British India, Netherlands, Norway, etc.

United Kingdom, British India and Netherlands, in that order of magnitude, furnished nearly 95 per cent of the May total and more than 95 per cent of the total for the month a year ago.

Steel Industry in Germany Well Occupied

(By Radio)

BERLIN, GERMANY, July 1.—All of the Steel Syndicate's domestic prices for July remain unchanged from June. The price of unsyndicated thin sheets has been advanced by 5 m. ($1.19) since the beginning of June.

Production of pig iron and steel is being well maintained and orders are coming in satisfactorily. The domestic market for structural steel is improved and export outlets are active, at advancing prices.

As a result of the Railroad Corporation's orders, the market for steel rails is more active. But bars are weakening in both domestic and export markets.

Machinery manufacturers report a continuation of the rapid increase in export orders. General improvement in the European market is expected by Rhenish-Westphalian experts.

German Non-Ferrous Cartel

BERLIN, GERMANY, June 16.—All the German non-ferrous metal associations have agreed to establish a central organization, with headquarters here, which will combine all existing associations and syndicates, including the producers of aluminum and the manufacturers of aluminum products. No name for the new association has yet been selected.

Industrial Engineering & Equipment Co., 1341 Syndicate Trust Building, St. Louis, has been appointed sales representative in southern Illinois and south central Missouri by the Despatch Oven Co., Minneapolis, Minn., manufacturer of industrial ovens, which include core and mold ovens, special drying ovens and conveyor ovens for high-speed production.

UNITED STATES IMPORTS OF PIG IRON BY COUNTRIES OF SHIPMENT
(In Gross Tons)

	May		Five Months Ended May	
	1929	1928	1929	1928
United Kingdom	6,342	4,556	23,832	29,251
British India	4,314	3,026	21,536	19,988
Germany	50	.....	103	40
Netherlands	2,916	1,888	13,874	12,621
Canada	36	.....	422	378
France	.....	.....	.....	.....
Belgium	.....	.....	184	202
Norway	228	41	876	41
Sweden	200	190	803	792
All others	307	31	435	183
Total	14,393	9,732	62,065	63,496

Machinery Exports Continue Large

May Total Greater Than for Any Month Between January, 1921, and January, 1929—Imports Much Heavier

WASHINGTON, June 27.—Exports of machinery of all kinds from the United States in May declined to $48,085,615 from $51,371,056 in April, making a drop for the second successive month. Imports of machinery and vehicles, on the other hand, continued to rise, apparently by reason of pending tariff legislation, and totaled $4,059,694, against $3,949,218. Imports listed in THE IRON AGE table totaled $3,191,787 in May and $3,015,094 in April. Exports in May of this year showed a substantial increase over those for the corresponding month of last year, with a total of $44,687,939.

Taking the first five months of the year, sharp increases were made in both exports and imports, the former rising to $255,357,842 from $186,666,589 for last year. Imports of machinery and vehicles aggregated $18,143,355 and $11,401,935 respectively. Imports of machinery listed in THE IRON AGE table were valued at $14,223,769 for the first five months, against $8,706,883 last year, while imports for May of last year, at $2,029,893, were far below the current figure.

Exports of industrial machinery in May were $22,158,220, according to the classification of the Division of Statistics, Department of Commerce, against $23,516,044 in April and $20,103,213 in May of last year. For the first five months of 1929 and 1928 respectively they were $116,061,209 and $88,479,157. Imports of industrial, office and printing machinery in May were $2,213,314, compared with $2,103,589 in April and $1,457,391 in May, 1928. For the first five months they were $10,374,581 in 1929, against $6,684,804 last year.

Power-driven metal-working machinery to the value of $2,354,826 was exported in May, compared with $2,804,788 in April and $1,966,866 in May of last year. For the five months of 1929 and 1928 the values were $14,045,444 and $9,787,716 respectively. Outgoing shipments of hand-driven metal-working machinery in May were $7,997,162, against $8,165,535 in April and $7,208,990 in May of last year. Exports for the first five months were valued at $40,784,846, against $32,083,946 for the corresponding period of last year.

Hours and Earnings in Metal-Working Plants

Studies of the Bureau of Labor Statistics of the United States Department of Labor show that the hourly earnings in the motor-vehicle industry in 1928 averaged 75c., compared with 72.3c. in 1925 and with 65.7c. in 1922. Owing to a slight reduction in the average length of the working week, which dropped from 50.3 hr. in 1925 to 49.4 hr. in 1928, the weekly earnings did not show so substantial an increase as did those measured by the hour. Average full-time weekly earnings were $32.92 in 1922, $36.37 in 1925 and $37.05 in 1928.

Entrance wage rates for common labor, as of last January, averaged 55.9c. an hour for the automobile industry. This average was the highest reported for any industry. The lowest was 30.8c., in saw mills, and the average for all industries about 45c. These figures are based on reports from plants employing nearly 140,000 common laborers.

Machinery Exports from the United States

(By Value, in Thousands of Dollars)

	May		Five Months Ended May	
	1929	1928	1929	1928
Locomotives	$101	$125	$793	$904
Other steam engines	94	221	405	452
Boilers	150	140	766	453
Accessories and parts	28	103	334	301
Automobile engines	1,303	1,714	6,898	6,876
Other internal combustion engines	811	712	4,485	3,040
Accessories and parts	472	388	2,059	1,572
Electric locomotives	13	368	298	939
Excavating machinery	867	929	3,577	3,525
Concrete mixers	80	117	616	445
Road-making machinery	427	274	1,428	894
Elevators and elevator machinery	317	414	2,117	1,775
Mining and quarrying mach'ry	1,633	1,429	6,989	5,538
Oil well machinery	1,872	1,107	10,930	5,635
Pumps	834	611	5,195	2,784
Bending and power presses	250	102	1,398	633
Forging machinery	65	54	574	310
Machine tools*	1,209	1,970	7,826	9,788
Other metal-working machinery and parts	624	581	3,179	2,461
Textile machinery	1,120	1,315	5,964	5,665
Sewing machines	810	820	4,343	3,700
Shoe machinery	177	149	937	774
Flour-mill and gristmill machinery	58	41	265	206
Sugar-mill machinery	257	310	1,128	1,880
Paper and pulp mill mach'ry	288	253	1,237	1,505
Sawmill machinery	67	82	395	384
Other woodworking mach'ry	209	168	971	764
Refrigerating and ice-making machinery	1,216	1,011	6,363	3,376
Air compressors	587	727	3,249	2,706
Typewriters	1,792	2,371	10,176	9,797
Power laundry machinery	183	148	846	482
Typesetting machines	509	450	2,666	1,894
Printing presses	791	730	3,196	2,642
Agricultural machinery and implements	11,263	10,144	60,027	43,719
All other machinery and parts	17,609	14,610	93,728	58,848
Total	$48,086	$44,688	$255,358	$186,667

*Principal items detailed in another table.

Imports of Machinery Into the United States

(By Value)

	May		Five Months Ended May	
	1929	1928	1929	1928
Metal-working machine tools	$62,865	$90,182	$489,689	$269,491
Agricultural machinery and implements	1,103,485	507,778	4,648,081	2,579,811
Electrical machinery and apparatus	194,172	202,991	948,945	960,486
Other power-generating machinery	148,862	40,482	488,965	72,552
Other industrial machinery	1,135,078	931,932	5,477,914	3,647,659
Vehicles, except agricultural	547,325	256,528	2,170,175	1,176,884
Total	$3,191,787	$2,029,893	$14,223,769	$8,706,883

Exports of Power-Driven Metal-Working Machine Tools

	May, 1929		April, 1929	
	No.	Value	No.	Value
Engine lathes	54	$115,415	98	$188,086
Turret lathes	25	84,163	49	164,387
Other lathes	105	180,531	83	136,701
Vertical boring mills and chucking machines	34	38,920	8	19,034
Thread-cutting and automatic screw machines	73	115,911	75	83,687
Knee and column type milling machines	24	64,001	43	107,132
Other milling machines	32	63,715	50	123,672
Gear-cutting machines	42	141,879	44	118,722
Vertical drilling machines	27	23,482	28	35,425
Radial drilling machines	14	48,296	4	8,241
Other drilling machines	160	36,397	187	100,272
Planers and shapers	33	50,461	35	50,864
External cylindrical grinding machines	47	95,843	54	146,800
Internal grinding machines	47	66,007	31	77,970
Metal-working tool-sharpening machines	95	48,177	290	47,067
Total	812	$1,173,198	1,079	$1,408,060

Machinery Markets and News of the Works

June Sales Satisfactory

Large Number of Unexpected Orders Is Feature of Machine Tool Buying—Heavy Production Continues

JUNE was a satisfactory month for the machine tool industry, though sales fell somewhat below those in May.

A feature of current buying is the number of unexpected orders placed by companies which are rushed with demands for their own products. Moreover, many of the purchases have been made by users who for months have shown little or no interest in new equipment.

Bookings have been in large enough volume to keep machine tool plants busy well into the fall. A leading lathe manufacturer expects to maintain production 50 per cent above normal until September, and this condition is not unusual with other companies.

Transactions in the past week included equipment for the General Electric Co., an airplane maker and a printing press company. Four railroads have bought heavy-duty equipment from a Cincinnati lathe builder, while the New York Central and the Burlington each have purchased small lots of tools. The Rock Island and the Chicago & North Western are in the market for a few machines. Railroad buying this year, however, has been disappointing.

The United States Air Corps, Wright Field, Dayton, Ohio, has taken bids on seven geared-head, motor-driven lathes. The Cleveland Union Terminals Co. has not yet bought 25 tools for which it recently inquired.

At Chicago, a farm implement manufacturer is reported ready to place orders for a large number of tools.

Indications are that demand for machine tools will continue steady.

New York

NEW YORK, July 2.—Buying of machine tools in good volume has continued the past week. Orders were received from the New York Central Railroad, the General Electric Co. and several others. An airplane company also bought a number of tools. Another buyer was a manufacturer of printing presses. A feature of current buying is the number of orders which are unexpected, the decision to purchase being quickly made by companies which are rushed with orders for their own products. Local sellers consider the outlook promising for steady demand during the midsummer months.

Contract has been let by Metropolitan Engineering Co., 1250 Atlantic Avenue, Brooklyn, manufacturer of protective devices and equipment, to T. E. Murray, 88 Lexington Avenue, New York, for extensions and improvements in two-story plant, to cost about $45,000 with equipment. E. W. Helms, New York address noted, is architect.

Ward-LaFrance Motor Truck Corporation, 276 Jackson Avenue, New York, has leased a building at Long Island City for a new service and repair plant.

Art Steel Co., 401 East Twenty-third Street, New York, manufacturer of steel boxes and containers, etc., is said to be planning a new local plant to cost over $150,000 with equipment. Present works will be removed to new location.

Officials of Electric Boat Co., 11 Pine Street, New York, manufacturer of motor boats, submarines, etc., with plants at Groton, Conn., and Bayonne, N. J., have organized Alto-Elco Aircraft Co., a subsidiary, to manufacture aircraft and parts. It is proposed to establish parts and assembling departments at one of present plants.

M. J. Ort, 424 East 149th Street, New York, architect, has plans for a six-story automobile service, repair and garage building, to cost about $125,000 with equipment.

Transport Aircraft Corporation has been organized to take over and succeed to Kaess Mfg. Corporation, Lindenhurst, L. I., manufacturer of airplanes and parts. New organization plans for sale of 40,000 shares of stock, no par value, part of proceeds to be used for expansion.

Shell Union Oil Corporation, 65 Broadway, New York, operating oil refineries, storage and distributing plants, pipe lines, etc., in California, Mid-Continent field, Texas and other points, is disposing of a preferred stock issue of $40,000,000, part of proceeds to be used for expansion. Company has arranged for purchase of New Orleans Refining Co., New Orleans, and will consolidate. Shell Eastern Petroleum Products, Inc., a subsidiary, has begun construction of new oil storage and distributing plant in Raritan Bay district, near Woodbridge, N. J., to cost more than $125,000 with equipment.

Schaefer & Rutkins, 2408 Grand Concourse, New York, architects, have plans for a six-story automobile service, repair and garage building, to cost about $300,000 with equipment.

New York Steam Corporation, 280 Madison Avenue, New York, has plans for an addition to power plant on Water Street, including improvements in present station, to cost more than $225,000 with equipment.

Segal Lock & Hardware Co., 155 Leonard Street, New York, with main plant at 55 Ferris Street, Brooklyn, is arranging an expansion program, including acquisition of property in Middle West, for a branch plant. Company has authorized an increase in capital stock, part of proceeds to be used for expansion noted.

Board of Education, Peekskill, N. Y., plans installation of manual training equipment in three-story high school, to cost $750,000, for which bids had been asked on general contract. Wilson Potter, 22 East Seventeenth Street, New York, is architect.

Perth Amboy Tile Works, Sayre Avenue, Perth Amboy, N. J., manufacturer of floor and wall tile, plans rebuilding part of plant recently destroyed by fire with loss estimated at over $300,000 including equipment. Company is a division of Beaver Falls Art Tile Co., Beaver Falls, Pa.

United States Aluminum Co., Garwood, N. J., has awarded general contract to Wigton Abbott Co., 705 Park Avenue, New York, for one-story addition, 60 x 120 ft., including improvements in present plant, to cost $45,000 with equipment. Company is affiliated with Aluminum Co. of America, Inc., Oliver Building, Pittsburgh.

Gold Seal Mfg. Co., Inc., 127 South Fifteenth Street, Newark, manufacturer of radio tubes and equipment, has acquired Rosasco Mfg. Co., 267 Wyckoff Street, Brooklyn, manufacturer of kindred apparatus, and will consolidate. Purchased plant will be continued in operation and a capacity output arranged, totaling close to 10,000 tube units and other equipment daily.

Jersey Central Power & Light Co., 20 South Street, Asbury Park, N. J., will soon begin construction of steam-operated electric generating plant at South Amboy, N. Y., with main unit, one story, 160 x 160 ft., to cost about $5,000,000 with transmission system. Electric Management & Engineering Corporation, 57 William Street, New York, is engineer, and will supervise erection.

Watson Flagg Engineering Co., 120 Liberty Street, New York, manufacturer of mechanical equipment, has awarded general contract to John W. Ferguson Co., Paterson, N. J., for one-story machine shop to plant at 843-7 East Twen-

ty-fifth Street, Paterson, 75 x 122 ft., to cost $35,000.

Herpers Brothers, 18 Crawford Street, Newark, jewelry manufacturers, will soon begin construction of two-story and basement addition, 26 x 62 ft., to cost about $30,000 with equipment. Edward A. Wurth, Jr., 207 Market Street, is architect.

East New York Iron & Wire Works, structural steel fabricator, formerly at 825 Sackman Street, Brooklyn, has moved to 47-71 East 100th Street, Brooklyn.

Luna Metal Craft Corporation, sheet metal specialties, stampings, etc., formerly located on West Twenty-first Street, New York, has moved to 38-40 Emerson Place, Brooklyn. H. A. Nodler is president.

Rheinegold Steel Products Co., 225 Broadway, New York, has been incorporated as agent in United States for Gewerkschaft Rheingold, Dusseldorf, Germany, export distributer of carbon and alloy steels, high speed steel and ball bearing material made by Stahlwerk Becker A. G., Willich near Krefeld, Germany.

Meurer Steel Barrel Co. has moved its offices to its new plant at 105 Avenue L, Newark, N. J., which will have capacity of 4000 barrels daily. Company will be in position to make prompt shipments by motor truck to all sections of New York metropolitan district.

Philadelphia

PHILADELPHIA, July 1.—Bids are being asked until July 8 by W. E. S. Dyer, Land Title Building, Philadelphia, architect and engineer, for a power plant at mill of Skenandoa Rayon Corporation, Utica, N. Y., to cost over $200,000 with equipment. Company also has plans by same engineer for additions to main mill, to cost more than $2,500,000 with machinery.

Philadelphia Insulated Wire Co., 200 North Third Street, Philadelphia, has taken over adjoining building, totaling about 7500 sq. ft. floor space, for expansion.

Hess-Bright Mfg. Co., Front Street and Erie Avenue, Philadelphia, manufacturer of ball bearings, has taken bids on general contract for a two-story and basement addition, to cost over $100,000 with equipment.

Vacuum Oil Co., 61 Broadway, New York, has awarded general contract to Turner Construction Co., Graybar Building, Philadelphia, for storage and distributing plant at Philadelphia, where property was recently acquired, to cost about $200,000 with equipment. Project will include one-story service, repair and garage building for company motor trucks.

Plant addition of Proctor & Schwartz, Inc., Seventh Street and Tabor Road, Philadelphia, manufacturer of drying and air-conditioning machinery, etc., referred to in these columns last week, will cost about $250,000 with equipment, instead of smaller amount previously noted. It is understood that unit will be occupied by Proctor & Schwartz Electric Co., a recently organized subsidiary, to manufacture electrical equipment used in conjunction with machinery of parent company. Simon & Simon, Fidelity-Philadelphia Building, are architects.

Philadelphia Salt Co., Pier 36, North Wharves, Philadelphia, has plans by A. C. Wood, 1411 Walnut Street, engineer, for one-story power plant, to cost $50,000 with equipment.

Acosta Aircraft Corporation, Trenton, N. J., operating at recently established plant on Whitehead Road, formerly used by Mercer Automobile Co., will establish a department for production of metal speed motor-boats, in addition to regular airplane manufacture. Boats will average about 12 ft. long, with beam measurement of 4 ft., and V-type step bottom, designed to use any type of outboard motor. George H. Stewart is general manager.

Thermoid Rubber Co., Whitehead Road, Trenton, N. J., has taken out a permit for a one-story addition, 100 x 170 ft., primarily for manufacture of automobile brake lining, to cost about $45,000.

Sylvania Products Co., Emporium, Pa., manufacturer of radio tubes and equipment, has leased a building at Lock Haven, Pa., and will remodel for branch plant to cost about $40,000.

J. E. Horton, 146 North Eleventh Street, Reading, Pa., and associates have organized Empire Steel Castings Co., and plan operation of foundry at Frush Valley, Berks County, to manufacture iron, steel and metallic alloy castings. Wallace E. Belcher, 313 South Broad Street, Philadelphia, is interested in new organization.

Best Body Corporation, Coatesville, Pa., has been organized to manufacture dump bodies for trucks and trailers and will let contracts for fabrication of bodies. R. C. Templin is president, and A. Brezovitz, vice-president.

The Crane Market

FEW sales of electric overhead or locomotive cranes have been reported in the past week, but some substantial business is pending, especially for overhead cranes, including four lists, one for seven cranes, one for nine cranes and two for 10 cranes each. Other overhead inquiries include a 3-ton, 20-ft. radius hand power jib crane and a 3-ton chain block for the Phoenix Utility Co., 71 Broadway, New York. Locomotive crane inquiries include two 25-ton cranes still pending for the New York Central Railroad and one 25-ton crane for the Atlantic Coast Line Railroad.

Among recent purchases are:

Baltimore & Ohio Railroad, Baltimore, eight 25-ton, Diesel engine-driven locomotive cranes from Industrial-Brownhoist Corporation.

National Tube Co., McKeesport, Pa., two 10-ton, 80-ft. 2-in. span overhead electric cranes for seamless tube mill from Alliance Machine Co.

Elmira Foundry Co., Elmira, N. Y., 22-ton, 8-wheel locomotive crane from Orton Crane & Shovel Corporation.

Buffalo

BUFFALO, July 1.—Superstructure will soon begin by Garlock Packing Co., Palmyra, N. Y., manufacturer of mechanical packing products for power plants, for a one-story addition, totaling about 10,000 sq. ft. floor space, to cost about $45,000 with equipment.

Oneida Community, Ltd., Oneida, N. Y., manufacturer of plated ware, animal traps, etc., is disposing of a note issue of $2,000,000, to be used in part for purchase of controlling interest in William A. Rogers, Ltd., Niagara Falls, N. Y., and Hartford and Wallingford, Conn., manufacturer of plated wares, cutlery, etc. Last noted organization will be continued under present name and plants maintained at existing locations; expansion in output will be arranged. Pierrepont B. Noyes is president of purchasing company.

Board of Education, Little Falls, N. Y., is considering installation of manual training equipment in new two-story junior high school to cost $275,000, for which plans have been drawn by F. Haug, Little Falls, architect; A. R. Acheson, Eckel Building, Syracuse, N. Y., is mechanical engineer.

William Weinert, 1 Newfield Street, Buffalo, and associates have organized Greenite Co., to operate a local foundry for manufacture of castings. Production is planned at early date. Harold J. Tillou, 21 Charham Drive, is also interested in new company.

Fire, June 24, destroyed welding shop at plant of American Laundry Machinery Co., Rochester, N. Y. It is planned to rebuild at once.

Pittsburgh

PITTSBURGH, July 1.—June business in this district was considerably ahead of May and probably one of the best summer months experienced in the industry. Nor has there been any marked decrease in the amount of business pending. Third quarter lists of large buyers are coming out, and the bulk of prospective purchases of the Westinghouse Electric & Mfg. Co. is expected to be released very soon. Railroad buying is rather quiet. The Pennsylvania Railroad is inquiring for a radius grinder.

Purchases are being made regularly for the large steel plant extensions under way in the Pittsburgh district. The A. M. Byers Co. is closing regularly on equipment for its new plant at Ambridge, Pa., and is also making purchases for its Warren, Ohio, plant, preparatory to turning that unit into a sheet bar mill, with pipe operations concentrated at Ambridge. Steel Corporation subsidiaries are active buyers for various plants.

Contract has been let by Gulf Refining Co., Frick Annex, Pittsburgh, to John N. Gill Construction Co., Franklin Trust Building, Philadelphia, for one and two-story addition to oil refinery at Girard Point, Philadelphia, to cost $330,000 with equipment. E. B. Lee, Seventh Avenue and Smithfield Street, Pittsburgh, is architect. Company has approved plans for construction of steam-turbo power plant at its refinery, Port Arthur, Tex., to cost more than $100,000 with equipment. United Engineers & Constructors, Inc., 112 North Broad Street, Philadelphia, will prepare plans for extensions and improvements in power house, tank department, pipe lines and other divisions at branch refinery on Staten Island, N. Y., to cost over $300,000 with equipment.

Coshocton Iron Co., Monongahela, Pa., manufacturer of castings, mining equipment, etc., has plans for a one-story addition, 160 x 480 ft., to cost about $130,000 with equipment. Company is a subsidiary of Combustion Engineering Corporation, 200 Madison Avenue, New York.

Service Mfg. Co., Erie, Pa., recently formed by K. C. Eagley, 1058 West Sixth Street, and associates, is said to be planning early operation of local plant to manufacture lubricating devices and equipment.

Wayne United Gas Co., Charleston, W. Va., operating natural gas properties, pipe lines, etc., in Wayne County, W. Va., and

in Kentucky, has arranged for a bond issue of $1,500,000, part of proceeds to be used for extensions and improvements.

Acme Steel Construction Co., Inc., 401 Third Avenue, Pittsburgh, is planning to rebuild part of plant destroyed by fire June 22.

Pittsburgh Plate Glass Co., Frick Building, Pittsburgh, has awarded general contract to W. S. Bellows, Herskowitz Building, Oklahoma City, Okla., for construction of a machine shop, storage and distributing building, and other units at Henryetta, Okla., where new sheet glass plant will be constructed, to cost about $2,000,000. Other building awards have been made to Rust Engineering Co., 606 Grant Street, Pittsburgh; contracts for main buildings will be let soon.

Detroit

DETROIT, July 1.—Property at Adrian, Mich., heretofore held by Adrian Improvement Co., has been purchased by Titan Electric Co., Butler, Ind., manufacturer of motors, generating apparatus and other electrical equipment. Plant will be removed from Butler to new location and additional equipment installed.

Sparta Foundry Co., Sparta, Mich., manufacturer of piston rings, etc., is arranging for expansion to cost about $100,000, including two new one-story units to provide about 20,000 sq. ft. additional floor space, and installation of equipment.

Buhl Aircraft Co., Marysville, Mich., has awarded contract to A. J. Zemmer, Port Huron, Mich., for hangar at airport near St. Clair, Mich., partly for airplane assembling, as well as for storage, to cost more than $45,000 with equipment.

Wolverine Screw Co., St. Jean Avenue, Detroit, has awarded general contract to W. J. C. Kaufmann Co., 10610 Shoemaker Street, for one-story addition, to cost over $40,000 with equipment.

Detroit Gasket Mfg. Co., 6209 Hamilton Street, Detroit, is arranging for a stock issue to total about $1,150,000, part of fund to be used for expansion and improvements.

Weatherproof Body Corporation, Corunna, Mich., manufacturer of automobile bodies, a division of Allied Motor Industries, Inc., Detroit, has purchased former plant of Field Body Corporation, Owosso, Mich., defunct, totaling about 200,000 sq. ft. floor space, and will occupy for branch plant. Equipment will be installed for production of bodies for commercial cars, truck cabs, body parts, etc. E. C. Morine is president of purchasing company.

Cadillac Aircraft Corporation, Detroit, recently organized with capital of 25,000 shares of stock, no par value, has taken over former plant and property of Stinson Aircraft Co., Northville, Mich., which recently removed its works to Wayne, Mich., and will occupy for manufacture of airplanes and parts. Initial production will be given over to amphibian units, designed to carry four persons, with parts manufacturing and assembling departments; engines will be purchased from outside sources. H. G. McCarroll is vice-president.

Simon Iron & Steel Corporation, Lansing, Mich., has awarded general contract to A. R. Foster, Lansing, for one-story storage and distributing plant, to cost over $35,000 with equipment.

Ford Motor Co., Detroit, has authorized an expansion program at aircraft manufacturing plant at Dearborn, Mich., to increase present floor space over 150 per cent. All departments will be enlarged, including parts division, which will take over work heretofore carried out at River Rouge plant. Production of one complete all-metal air transport daily is planned. Program is reported to cost over $450,000 with equipment.

Sky Specialties Corporation, 3651 Hart Avenue, Detroit, has been organized as consolidation of Simon Airplane Appliance Co. and Heywood Starter Corporation. Capitalization consists of 200,000 shares of stock of which 125,303 are outstanding. Company will manufacture self-starters and other airplane parts. Arthur L. Cash is president; F. L. Riggin, vice-president, and S. D. Den Uyl, secretary and treasurer.

Peoples Clamp Corporation, Twelfth and Sycamore Streets, Wyandotte, Mich., has been organized to take over Peoples Clamp Corporation of New York. Company will manufacture patented double-wrapped hose clamp for automobiles, airplanes, motors and all hose connections. Purchase of new machinery is contemplated.

Ex-Cell-O Tool & Mfg. Co., Detroit, has changed its name to Excello Aircraft & Tool Corporation because of large increase in its production of aviation parts. A public issue of stock will be made shortly, proceeds of which will be devoted to plant expansion. Present plant, built in 1928, has 50,000 sq. ft. of floor space. Company expects to manufacture several additional parts for airplanes and Diesel motors.

Cleveland

CLEVELAND, July 1.—Machine tool sales were good the past week. While inquiry has fallen off, dealers closed on a good volume of single tools that had been pending for some time. June, on the whole, was a very satisfactory month for the machine tool industry, although business fell somewhat below that of May. A local turret lathe manufacturer, who broke previous sales records in May, reports a decline of only 20 per cent from its May volume.

The Air Corps, War Department, Wright Field, Dayton, Ohio, received bids June 27 for three 14-in. x 6-ft. and four 16-in. x 8-ft. geared head motor-driven lathes for shipment to various points. There were five bidders, the bids ranging from about $16,000 to $20,000. Cleveland Union Terminals Co. has not yet purchased the 25 machines for which it recently inquired.

Ohio Seamless Tube Co., Shelby, Ohio, has approved plans for a 40 per cent increase in its plant capacity which will involve an expenditure of about $400,000 in buildings and equipment.

Contract has been let by Franklin Steel Co., 5426 Lake Court, Cleveland, to Boldt-Rapp Co., 5511 Euclid Avenue, for one and two-story addition to plant, to be used in part for shear department and storage and distribution, to cost about $40,000 with equipment.

Pennsylvania-Ohio Power & Light Co., 25 East Boardman Street, Youngstown, has plans for a steel tower transmission line from generating station at Toronto, Ohio, to Akron and vicinity, consisting of 580 towers, switching facilities, etc., to cost more than $500,000. Stevens & Wood, Inc., 20 Pine Street, New York, are engineers.

Lakeland Aviation Co., Inc., Union Trust Building, Cleveland, is considering new one-story plant for aircraft manufacture, to cost about $40,000 with equipment. J. E. Mathews is president.

Kasle Iron & Metal Co., 1102 Lagrange Street, Toledo, Ohio, has awarded general contract to Kopitke Construction Co., 321 Wabash Street, for one-story plant, to cost about $40,000 with equipment. Forster & Wernert, Nicholas Building, are architects.

Ohio Fibrated Asphalt & Rubber Co., Sandusky, Ohio, recently organized by H. R. Greenlee, president of former Erie Rubber Co., Sandusky, has taken over plant of latter company and will remodel for manufacture of mechanical rubber goods, including molded specialties, and fibrated asphalt products for expansion joints, etc.

Bender Body Co., 6409 Barberton Avenue, Cleveland, manufacturer of automobile bodies, has awarded general contract to A. M. Higley Co., Plymouth Building, for one-story addition, 135 x 170 ft., to cost about $140,000 with equipment.

New England

BOSTON, July 1.—Dealers report a decline in machine tool sales. Transactions included a number of lathes, two milling machines, grinders, punches and other presses. Fresh inquiry is scarcer and the outlook is not encouraging in view of the fact that metal-working plants wanting tools and unable to secure fairly prompt deliveries have stated that purchases will not be made until after the opportunity to inspect tools on exhibition at the national show in September. Business in used tools is dull.

June sales of small tools totaled larger than expected. Bookings, however, were less than in May. Deliveries on certain types of tools are still quite extended.

Dewey & Almy Chemical Co., 235 Harvey Street, Cambridge, Mass., will build a machine shop.

J. W. Greer Co., 119 Windsor Street, Cambridge, Mass., confectionery and baking machinery, has plans for a manufacturing plant at Waltham, Mass.

American Mineral Products Co., Inc., 983 Main Street., Hartford, Conn., will soon ask bids on a one-story, 36 x 200 ft. plant, at Walpole, N. H.

James Hunter Machine Co., 2 Main Street, North Adams, Mass., is erecting a one-story, 72 x 154 ft. machine shop addition. Aberthaw Co., Boston, is contractor.

J. T. Healy & Son, 196 Main Street, Attleboro, Mass., jewelry manufacturers, are erecting a one-story manufacturing plant, 26 x 96 ft. Buffing tools are under consideration.

Electric Boat Co., New London, Conn., has formed Alto-Elco Aircraft Co. to manufacture airplanes. Details of production have not yet been worked out.

Worcester Brass & Electric Plating Co., 316 Shrewsbury Street, Worcester, Mass., lost by fire all enameling ovens and accessories. Company plans to install new equipment soon.

Wireless Specialty Apparatus Co., 76 Atherton Street, Roxbury district, Boston, has plans for a one-story, shipping room and platform 25 x 100 ft. Conveying equipment is under consideration.

A. G. Spalding & Brothers, Center Street, Chicopee, Mass., sporting goods, has started work on a two-story machine shop 30 x 80 ft., and one-story forging unit, 30 x 84 ft.

Warren Telechrone Co., Ashland, Mass., has plans for an addition. Details will be given out soon.

Westfield Boys Trade School, Westfield, Mass., has plans for a three-story

trade school addition, 75 x 180 ft. C. Derby is principal.

City of Westfield, Mass., will have plans ready about July 17 for a trade school addition to cost $80,000. New mechanical equipment will be needed.

City of Hartford, Conn., will close bids next week on a one-story repair shop addition, 32 x 92 ft. Miscellaneous small tools will be required.

American Coal & Chemical Co., 55 Derby Street, Salem, Mass., has plans for a one-story, 45 x 80 ft. coal pocket. Coal handling equipment will be purchased.

City of Meriden, Conn., has plans for a three-story trade school, 60 x 250 ft.

Bids will be taken at once by Fletcher-Thompson, Inc., 542 Fairfield Avenue, Bridgeport, Conn., architect and engineer, for new steam power plant at Stamford Hall Sanitarium, 70 Summer Street, Stamford, Conn., including three 150 hp. boilers, three stokers, flue stack and auxiliary equipment.

Chemical Paper Mfg. Co., Holyoke, Mass., manufacturer of processed papers, has asked bids on general contract for two new units, two stories, 50 x 195 ft. and 35 x 75 ft., to cost about $200,000 with equipment.

Butchart-Nicholls Co., Glenbrook, Conn., manufacturer of golf clubs, irons, etc., has purchased former plant of British-American Mfg. Co., in Springdale district, Stamford, Conn., and is said to be planning early occupancy of part of property for expansion.

North Dighton Stove Co., 1 Railroad Avenue, Taunton, Mass., is rebuilding part of plant, including foundry and assembling department, recently destroyed by fire, to cost over $85,000 with equipment.

James Hunter Machine Co., North Adams, Mass., is planning one-story addition, 70 x 160 ft., primarily for an assembling and erecting shop, to cost over $50,000.

Boston & Albany Railroad Co., South Station, Boston, is planning extensions and improvements in engine house and shops at West Springfield, Mass., to cost about $500,000 with equipment.

Providence Spring Bed Mfg. Co., 355 Washington Street, Providence, R. I., has been organized to manufacture springs, metal beds, etc. Company is in market for materials.

St. Louis

ST. LOUIS, July 1.—Plans are being drawn by Air Terminal Corporation, Kansas City, Mo., care of Buckley & Van Brunt, Gloyd Building, architects, for airport near city, consisting of steel hangars, repair shops, oil storage and other units, to cost more than $500,000 with equipment.

American Eagle Aircraft Corporation, Kansas City, Mo., is planning establishment of factory branches and distributing plants at Chicago, Portland, Minneapolis, Dallas, Tex., and Atlanta, Ga., each one story, entire group to cost more than $100,000 with equipment.

Cities Service Oil Co., Tulsa, Okla., has plans for new storage and distributing plant at Perry, Okla., to cost about $50,000 with equipment. O. P. Blankenburg is construction superintendent in charge.

Gardner Motor Co., Main and Rutger Streets, St. Louis, is arranging for sale of 200,000 shares of stock, totaling about $2,500,000, a considerable part of proceeds to be used for expansion. Company has contracted with Sears, Roebuck & Co., Chicago, mail order distributers, for production of light type automobile to retail at $500, and will develop quantity output of new car within five to six months. Regular line of Gardner cars will be continued as heretofore. Part of appropriation noted will be used for development of Parks Aircraft Co., a subsidiary, operating at a recently established plant in East Side district; three types of monoplanes will be constructed, to retail from $3,500 to $12,000, and complete facilities for parts manufacture and assembling will be provided. Amos O. Payne is chief engineer of Parks organization.

City Council, Columbia, Mo., has plans for addition to municipal electric light and power plant, to cost more than $40,000 with equipment. Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is engineer.

Manhattan Motor Co., Manhattan, Kan., has awarded general contract to M. J. Green, Manhattan, for two-story service, repair and garage building, 100 x 150 ft., to cost about $100,000 with equipment. A. H. Brewer, 250 East Ohio Street, Chicago, is architect.

Fairfax Airport Co., Kansas City, Mo., will soon take bids for a two-story mechanical shop, 50 x 160 ft., to cost over $40,000 with equipment. Charles A. Smith, Finance Building, is architect.

Chicago, Burlington & Quincy Railroad Co., Omaha, Neb., is reported planning extensions and improvements in engine house at McCook, Neb., to cost about $45,000 with equipment.

South Atlantic

BALTIMORE, July 1.—Bids have been asked by W. A. Fingles, Inc., 29 South Howard Street, Baltimore, operating a sheet metal works, for a two-story plant to cost about $65,000 with equipment. E. B. Glank, 330 North Charles Street, is architect. William A. Fingles is president.

Curtiss-Caproni Corporation, 27 Broadway, New York, and Munsey Building, Baltimore, has approved plans for initial units of new plant to manufacture aircraft on site recently acquired at Baltimore, to be one-story, 400 x 500 ft., including foundry, forge and machine shops and other departments for parts production and assembling, to cost over $350,000 with equipment. A one-story power plant will also be built. Additions will be made later to cost close to like sum. Company is affiliated with Curtiss Aeroplane & Motor Co., Buffalo.

Overhead Door Co., Richmond, Va., recently formed with capital of $500,000 by M. R. Mills, Jr., Rockbridge and High Point Avenues, and associates, plans development of local plant to manufacture doors for garages and other service, including door hangars and accessories.

City Council, Brunswick, Ga., is said to be planning establishment of a municipal airport, including hangars, repair shop, oil storage and other units, to cost more than $70,000 with equipment.

Carolina Casket Co., High Point, N. C., is planning to rebuild machine and cabinet departments destroyed by fire June 23.

A. Ten Eyck Brown, Forsyth Building, Atlanta, Ga., architect, has awarded general contract to J. S. McCauley Co., Bona Allen Building, for three-story and basement automobile service, repair and garage building, 100 x 125 ft., to cost about $125,000 with equipment.

Chief of engineers, United States Army, Washington, has authorized an early call for bids by district engineer, New Orleans, for 1,500,000 linear feet of galvanized wire rope.

Dixie Flying Service, Inc., Malcolm G. Robinson, vice-president, 41 Maiden Lane, New York, recently organized, is planning establishment of airport at Charlottesville, Va., where 125-acre tract has been acquired, to include all-steel hangar, repair and reconditioning shop, and other units, to cost about $75,000 with equipment.

Stanley Manganese Mines, Luray, Va., about eight miles from city, have been acquired by new interests, and will be reopened at once; property has been shut down for a number of months. Plans are under way for improvements, including installation of additional equipment to cost about $50,000.

Board of Education, Columbia, S. C., has plans for addition to senior high school, including a manual training shop, to cost more than $150,000 with equipment. Appropriation has been approved in amount of $500,000 for this and other school work, including new junior high school where manual training department is planned. J. B. Urquhart, Palmetto Building, is architect.

United Motors Service, Inc., Atlanta, Ga., O. J. Coe, manager, a subsidiary of General Motors Corporation, Detroit, has leased structure to be erected at West Peachtree Street and Grant Place, for new service, repair and garage building, to cost $200,000 with equipment. Ivey & Crook, Candler Building, are architects in charge.

Electric Storage Battery Co., Philadelphia, has recently placed in operation new factory branch at 210 Walker Street, S. W., Atlanta, where Exide batteries for automobiles and for various industrial purposes will be assembled. New plant is headquarters of sales and engineering staffs operating in South under direction of Mark C. Pope, Jr., manager.

Milwaukee

MILWAUKEE, July 1.—Machine-tool builders are entering the last half of the year with the largest volume of unfilled orders most of them have ever had at this season. In most shops June business fell but slightly below the average of the preceding five months, and some report bookings as large as in May. Little progress has been made toward prompt delivery, and shipment on current orders cannot be promised earlier than four to six months. Inquiries indicate continued good demand.

Milwaukee Electric Railway & Light Co., 217 Michigan Street, Milwaukee, is awarding contracts for an addition to its Cold Spring car building and maintenance shops which will require considerable new equipment. Estimated investment will be about $150,000. R. H. Pinkley, assistant general manager, is in charge.

Waukesha Motor Co., Waukesha, Wis., manufacturer of industrial gasoline engines, rail motors, etc., is considering establishment of an aircraft engine division which will not require immediate new construction, but additional precision equipment. Harry L. Horning is president and chief engineer.

Bell Machine Co., 35-59 Jackson Street, Oshkosh, Wis., is in market for miscellaneous equipment for a two-story machine shop addition, 50 x 85 ft., to be ready early in September.

Wrought Washer Mfg. Co., 46-54 South Bay Street, Milwaukee, is about to start work on a two-story addition, 75 x 140 ft. Orders have been placed for nearly all equipment required.

Nash Motors Co., Kenosha, Wis., has broken ground for a one-story extension, 42 x 145 ft., to its foundry at main works in Kenosha.

Common Council of West Allis, suburb of Milwaukee, will take bids about July 15 or 20 for installation of a 1,000,000-gal. elevated steel tank and tower and connecting main in municipal waterworks system. Bond issue of $64,000 has been made to cover cost. William Darby is city engineer.

Miami Engineering Co., Dayton, Ohio, which recently established an office and drafting room in Commerce Building, Milwaukee, is considering the installation of a plant for manufacturing tools, dies, fixtures and special machinery. A decision is expected shortly. A. V. Regan is manager at Milwaukee.

Snap-On Wrench Co., 1270 South Pierce Street, Milwaukee, manufacturer of mechanics' tools, is preparing to build a new plant costing about $85,000 for joint use with Blue Point Tool Co., 317 Mineral Street, Milwaukee, which its officers control. Present force will be doubled in new quarters. William Seideman is secretary and treasurer.

Indiana

INDIANAPOLIS, July 1.—Plans have been filed by Edwards Iron Works, Inc., 2101 South Main Street, South Bend., for storage and distributing plant, consisting of two one-story units, 75 x 360 ft., and 40 x 360 ft., to cost about $55,000 with equipment.

W. A. Gingerick, Arkon, near Peru, and associates have organized a company to manufacture iron and other metal castings, capitalized at $50,000. Plans have been approved for initial foundry unit, one story, 66 x 100 ft., to cost about $35,000 with equipment.

Norris Fertilizer Co., Rushville, has awarded general contract to D. Meinken & Son, 2143 Bernard Street, Cincinnati, for rebuilding part of commercial fertilizer plant recently destroyed by fire.

Interstate Public Service Co., Wild Building, Indianapolis, is planning construction of power transmission line from Indianapolis to Bloomington, Martinsville and vicinity; a substation and switching station will be erected on 4-acre tract at Bloomington. Project will cost about $500,000, with steel towers and other equipment.

Western Oil Co., 310 North Meridian Street, Indianapolis, has plans for a one-story machine shop and service station at Kokomo, to cost about $50,000 with equipment; similar works will be constructed at Brazil, Ind., to cost like amount. Bishop-Knowlton & Carson, 312 North Meridian Street, are architects.

United States Corrugated Fibre Box Co., 1315 Martindale Avenue, Indianapolis, has plans for new one and two-story and basement plant totaling 100,000 sq. ft. floor space, to cost $200,000 with equipment. Charles E. Bacon, Odd Fellows Building, is architect. H. J. Lacey is president.

Board of Education, Speedway City, has authorized installation of manual training equipment in addition to local school, to cost about $100,000, for which bids are being asked on general contract until July 11. McGuire & Shook, 941 North Meridian Street, Indianapolis, are architects.

Davidson Enamel Products, Inc., Lima, Ohio, has started operations in a branch plant at Connersville.

Chicago

CHICAGO, July 1.—Machine tool sales in June declined slightly from the total for May. Business is more spotty, some dealers finding sales larger, while others report smaller bookings.

There is a dearth of railroad business. The only list of note was that of the Santa Fe, and the number of tools purchased was not comparable with those bought in recent years. The Rock Island is asking for prices on an axle lathe and several grinders. The Chicago & North Western is in the market for several floor grinders. The Burlington has purchased two shapers and two lathes. One farm implement manufacturer is ready to place a large number of tools and another plans to buy equipment about Oct. 1. Continental Motors Corporation, Muskegon, Mich., is said to be in the market.

K. B. Auto-Radio Laboratories, Inc., manufacturer of radio sets exclusively for installation in automobiles, has leased factory at 2925 Calumet Avenue, Chicago, containing 15,000 sq. ft. of space.

Chester A. Phillips has organized Chester A. Phillips & Co., with offices at 37 West Van Buren Street, Chicago, to deal in contractors', marine, quarry, railroad and industrial equipment, both new and used.

Contract has been let by Ostrander-Seymour Co., 1900 South Fifty-fourth Avenue, Cicero, Ill., manufacturer of machinery and parts, to G. P. Cullen, 2940 West Lake Street, Chicago, for one-story addition, to cost about $45,000 with equipment.

Jensen Radio Co., Clearing industrial district, Chicago, has plans for one-story addition, totaling about 25,000 sq. ft. floor space, to cost about $70,000 with equipment.

J. H. Murphy, care of W. G. Uffendell, 39 South State Street, Chicago, architect, has plans for a two-story power house, 65 x 120 ft., to cost about $40,000 with equipment.

Davenport Machine & Foundry Co., West Fourth Street, Davenport, Iowa, has awarded general contract to Arthur H. Newman & Co., Des Moines, Iowa, for one-story foundry addition, to cost about $50,000 with equipment. Clausen, Kruse & Klein, Kahl Building, are architects.

John Deere Tractor Co., Waterloo, Iowa, manufacturer of tractors, gas and gasoline engines, etc., has awarded general contract to H. A. Main Construction Co., Marsh Place Building, for three-story addition, 60 x 122 ft., to cost about $50,000 with equipment.

Northern Pacific Railroad Co., Railroad Building, St. Paul, Minn., has plans for extensions and improvements in engine house at Mississippi and York Streets, with shop facilities, to cost $40,000. O. M. Rognan is company architect.

Flour City Ornamental Iron Co., Minneapolis, Minn., has begun work on an expansion program to double capacity of plant, to cost about $85,000 with equipment. Company was recently acquired by General Bronze Corporation, Pittsburgh, and will be a unit of that organization.

Northfield Iron Co., Northfield, Minn., has work under way on one-story addition, 40 x 95 ft. C. L. Brown is president and manager.

Willis J. Spaulding, commissioner of public property, City Hall, Springfield, Ill., will receive bids until July 15 for extensions and improvements in municipal power plant, including boiler, underfeed or chain grate stoker, air preheater, economizer, superheater and auxiliary equipment. Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is consulting engineer.

Monarch Aircraft Co., Rockford, Ill., H. L. Millington, superintendent, has awarded general contract to Tolmie Brothers, 919 Taylor Street, for one-story unit, 120 x 140 ft., for parts production and assembling, to cost more than $50,000 with equipment.

National Parking Garages, Inc., care of Walter W. Ahlschlager, 65 East Huron Street, Chicago, architect, has awarded general contract to Starrett Building Co., 8 South Dearborn Street, for multi-story service, repair and garage building, to cost more than $2,000,000 with equipment.

Cincinnati

CINCINNATI, July 1.—Buyers of machine tools have placed sufficient orders with manufacturers to keep local plants busy well into the fall. The demand is diversified and consists of small lots of machines. A leading lathe builder states that current bookings are sufficient to maintain production 50 per cent above normal into September. A number of orders have been placed by purchasers who have shown little or no interest in new equipment for many months.

Four railroads have purchased several heavy-duty lathes from a local manufacturer.

Department of Service, City Hall, Cincinnati, has awarded a general contract to William Miller & Son, 1950 Central Parkway, for steel hangar at municipal airport, 485 ft. long, with shop and repair facilities, to cost about $75,000 with equipment. Kruckemeyer & Strong, St. Paul Building, are architects.

Firestone Tire & Rubber Co., Akron, Ohio, will soon take bids on general contract for multi-story factory branch and distributing plant at Cincinnati, to cost about $150,000 with equipment. Samuel Hannaford & Son, Dixie Terminal Building, Cincinnati, are architects.

Murray Corporation of America, Inc., 1424 Aberle Avenue, Detroit, has awarded general contract to Rock City Construction Co., Nashville, Tenn., for second unit at plant at Memphis, Tenn., one story, 575 x 640 ft., to cost about $1,000,000 with equipment. Albert Kahn, Inc., Detroit, is architect and engineer.

Sterling Wood Products Co., Knoxville, Tenn., has work under way on one-story addition to automobile body parts plant, to cost over $85,000, for which general contract recently was let to J. M. Dunn & Son, 245 Broad Street.

Crane Co., 836 South Michigan Avenue, Chicago, has leased a two-story and basement building, 75 x 175 ft., to be erected at 179-81 Third Avenue, North, Nashville, Tenn., by Nashville Trust Co., for new factory branch and distributing plant, to cost about $100,000 with equipment. Hart, Freeland & Roberts, Independent Life Building, Nashville, are architects.

Reynolds Metal Co., 2934 Grand Avenue, Louisville, subsidiary of United States Foil Co., has plans by Arthur G. Tafel, 142 South Third Street, architect, for initial unit of new three-story plant, to cost about $150,000 with equipment.

Other structures will be erected later. Entire project will represent investment of over $500,000.

Tennessee-Eastman Corporation, Kingsport, Tenn., subsidiary of Eastman Kodak Co., Rochester, N. Y., has awarded general contract to Gauger-Korsmo Construction Co., Memphis, Tenn., for two of group of four new units, for production of cellulose acetate, acetic acid, and kindred products. Main building will be one and three stories, 100 x 320 ft. Entire project will cost more than $1,000,000 with equipment. Contract for additional units will be let soon, including power plant; plans for latter are being drawn by Baker & Spencer, 17 Battery Place, New York, engineers.

Board of Education, North Olmsted, Ohio, is considering installation of manual training equipment in two-story senior and junior high school to cost about $300,000, for which bids are being asked on general contract until July 10. Walker & Norwick, Third and Main Streets, Dayton, Ohio, are architects.

Gulf States

BIRMINGHAM, July 1.—A 50-acre tract partly on ship channel at Houston, Tex., has been acquired by Phillips Petroleum Co., Bartlesville, Okla., and plans are under consideration for new oil refinery to cost about $600,000.

El Paso Electric Co., El Paso, Tex., is disposing of bond issue of $4,000,000, part of proceeds to be used for extensions and improvements, including a new steam-operated electric power plant, additional equipment in present power station for utilization of natural gas as fuel, and additions to transmission lines.

Mississippi Power & Light Co., Jackson, Miss., has plans for one-story car barn, 110 x 115 ft., with inspection and shop facilities, to cost about $40,000 with equipment. N. W. Overstreet, Mississippi Fire Insurance Building, is architect.

Republic Iron & Steel Co., Youngstown, is said have plans for extensions and improvements in iron ore properties, known as Spaulding mines, near Birmingham, including electrification of mines, installation of electrically-operated loaders, mining machinery, crushers, etc., to cost about $175,000.

Southern Gas Co., San Antonio, Tex., has arranged for sale of a preferred stock issue to total $1,187,000, part of proceeds to be used for extensions and improvements in natural gas properties, including pipe line construction.

Dallas Airport Utilities Corporation, Dallas, Tex., is being organized under direction of Dallas Chamber of Commerce, Charles W. Davis, chairman of organization committee, to carry out an airport project at Love Field. Corporation will have capital of $500,000, to be secured through public subscriptions. Plans are under way for initial hangar, 200 x 300 ft., with shop and repair facilities, to cost $75,000.

Scobey Fireproof Storage Co., 315 North Medina Street, San Antonio, Tex., has plans for a seven-story electrically-operated cold storage and refrigerating plant, to cost about $400,000 with equipment.

Arkansas-Louisiana Pipe Line Co., Ardis Building, Shreveport, La., a subsidiary of Arkansas Natural Gas Corporation, same address, has plans for a natural gas compressor plant at Sterlington, La., about 20 miles from natural gas fields at Monroe, La., to cost about $1,000,000 with machinery. Station will be used in connection with new pipe line from Monroe to Shreveport, about 100 miles, and will have an initial capacity of 10,000 hp., to be increased to 16,000 hp. later.

Texas & Pacific Railway Co., Fort Worth, Tex., is planning construction of eight-story and basement storage and distributing warehouse, 100 x 600 ft., with cold storage and refrigerating division, to cost $2,000,000 with power equipment and other machinery. Wyatt C. Hendrick is company architect.

Globe Oil & Refining Co., Blackwell, Okla., has acquired property at Corpus Christi, Tex., and is said to be planning construction of new oil refinery, to cost more than $250,000 with equipment.

Houston Independent School District, Houston, Tex., has plans for a new vocational school, to cost $100,000 with equipment. Other units will be constructed later. J. W. Northrop, Kirby Building, is architect; H. L. Mills is business manager.

Pacific Coast

SAN FRANCISCO, June 27.—Pacific Gas & Electric Co., 245 Market Street, San Francisco, has plans for one-story equipment storage and distributing plant to cost $100,000. Engineering department of company is in charge.

Swanson & Peterson, Pasadena, Cal., manufacturers of furniture, have awarded general contract to M. Magnuson, Altadena, Cal., for one-story, sawtooth roof factory, 70 x 140 ft., to cost about $60,000 with equipment. Swasey & Hayne, Security Building, Los Angeles, are architects.

Columbia Steel Co., Pittsburg, Cal., plans rebuilding part of plant destroyed by fire June 22.

Standard Auto Body Works, Inc., 1501 South Central Avenue, Los Angeles, has plans for one-story addition, 100 x 140 ft., to cost $70,000 with equipment. C. Godfrey Bailey, Hillstreet Building, is architect.

Paramount Portland Cement Co., 2030 Wilshire Boulevard, Los Angeles, recently organized, has awarded general contract to Hellbush & Co., Los Angeles, for new mill at Torrance, including machine shop, power house, packing house and other units, entire project to cost about $1,500,000 with equipment.

City Council, Baker, Ore., has authorized employment of engineer to make surveys relative to establishment of municipal electric light and power plant, to cost $100,000 with equipment.

L. D. Bohnett, Bank of San Jose Building, San Jose, Cal., attorney, represents local interests organizing a company to construct and operate an airport on Alum Rock Avenue, where tract, 500 x 5280 ft., is being secured. Project will include hangars, repair and reconditioning shops and other units, to cost $150,000 with equipment.

Idaho American Phosphate Co., Nampa, Idaho, H. B. A. Arment, vice-president, has plans for new phosphate mill in Bloomington Canyon, about 3 miles from Paris, to cost over $100,000 with equipment.

Firestone Tire & Rubber Co., Akron, Ohio, has begun work on addition to branch tire and rubber tube plant at Los Angeles, to cost more than $3,000,000 with equipment.

Board of Education, Nebo School District, Springville, Utah, has plans for new mechanics art building, one story, 65 x 105 ft., to cost about $90,000 with equipment. Ashton & Evans, Vermont Building, Salt Lake City, Utah, are architects.

Canada

TORONTO, July 1.—Machine tool sales for June showed a slight improvement over those for May. Large lists were few, but a steady demand prevailed for single tools. Sales the last few days of the month showed general falling off. The Dominion Day holiday had some effect on business, and a number of prospective buyers postponed purchases until after the first of July. The outlook continues bright, and builders and selling agencies look for a large volume of business from inquiries on hand.

Alemite Products of Canada, Ltd., Belleville, Ont., will start work immediately on a two-story factory to cost $60,000. W. H. Patterson Construction Co., Patterson Block, is general contractor.

Hayes Wheel & Forgings, Ltd., Chatham, Ont., has started work on an addition, 180 x 400 ft., to cost about $500,000. E. P. Muntz, Ltd., Temple Building, Toronto, has general contract. Equipment has not yet been purchased.

Chestnut Canoe Co., Fredericton, N. B., has awarded contract to John Powers, 262 O'Dell Avenue, for an addition to cost $22,000.

Newton Construction Co., Ltd., Sherbrooke, Que., has been awarded contract by Textile Co. of Canada, Ltd., Louisville, Que., for a factory to cost $250,000. Philip Fainer, 1470 Peel Street, Montreal, is president. Charles P. Main, Boston, Mass., is engineer.

Canadian Ohio Brass Co., Ltd., Chippewa, Ont., will start work at once on a one-story addition. Smith Brothers, 1740 Ellen Avenue, are general contractors. Findlay & Faulis, 644 Erie Avenue, Niagara Falls, Ont., are architects.

William Collins & Son, Barrington Street, Halifax, N. S., have awarded general contract to Emile Bianco, 1 Kane Place, for a two-story machine shop, to cost $15,000.

Hart Battery Co., St. Johns, Que., has awarded general contract to Walter G. Hunt & Co., 1405 Bishop Street, for two one-story factories, to cost $45,000.

Canadian Gas & Equipment Co., Ltd., Montreal, has awarded general contract to John MacGregor, 1410 Stanley Street, for a two-story factory, to cost $20,000.

Western Canada

International Paper Co., Montreal, is contemplating building 500-ton paper mill at Beaver Cove on Vancouver Island, to cost about $4,000,000.

Town Council, Cardston, Alberta, has plans by Lee Gilchrist, architect, for erection of a power plant to cost $37,000.

Excavation has been started for first unit of an aircraft factory at 1927 Georgia Street, West, Vancouver, B. C., to cost $55,000, for Hoffar-Beeching Shipyards, Ltd. George Hoffar is architect. Austin Co. of Canada, Ltd., 1009 Rogers Building, has general contract.

Brunette Lumber Co., Ltd., Sapperton, B. C., is having plans prepared for a planing mill at New Westminster, B. C., to replace one recently destroyed by fire. New mill will cost $100,000.

Bids are being received by consulting engineers, Underwood & McLellan, Saskatoon, Sask., for waterworks pumping station, sewage disposal plant, etc., for town of Melville, Sask.